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THE NATIONAL POTATO-BREEDING PROGRAM, 1966

U. S. DEPT. OF AGRICULTURE
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DISCLAIMER

Trade names are used in this publication only to provide specific information. Their use does not constitute a guarantee of the products named and does not signify that they are approved by the U.S. Department of Agriculture to the exclusion of others of suitable composition.

PRECAUTIONS

Chemical compounds to control potato insects and diseases are poisonous; handle them with care. Follow directions and heed all precautions on container labels.

Chemical compounds should be kept in closed, well-labeled containers in a dry place where they will not contaminate food or feed, and where children and pets cannot reach them.

Observe good hygiene when handling chemical compounds. Wear clean clothing. Avoid repeated or prolonged contact of chemicals with the skin. Do not inhale dusts or mists. Wash hands and face before eating or smoking.

Calcium arsenate, DDT, Kelthane, malathion, metaldehyde, methoxychlor, Sevin, and sulfur can be used safely without special protective clothing or devices if they are in diluted dust or water-spray forms.

Most chemical concentrates require special precautions in handling. Avoid spilling them on the skin; keep them out of the eyes, nose, and mouth. If you spill concentrate on skin or clothing, wash it off the skin and change clothing immediately. If it gets in the eyes, flush them with plenty of water for 15 minutes, and get medical attention.

Aldrin, chlordane, diazinon, dieldrin, endosulfan (Thiodan), and toxaphene can be absorbed directly through the skin in harmful quantities. When working with these chemicals in any form, take the same precautions as with concentrates.

Endrin, Guthion, and parathion, are extremely poisonous and may be fatal if swallowed, inhaled, or absorbed through the skin. Carbophenothion (Trithion) is highly toxic if inhaled or swallowed; it is less toxic by skin contact. These chemicals should be applied only by a person thoroughly familiar with their hazards who will assume full responsibility for safe use and comply with all precautions on the labels. When using these insecticides, reduce the danger of skin exposure by wearing recommended protective clothing and equipment.

Do not transfer ethylene dibromide from one container to another in a closed room; do not breathe the fumes.

To protect fish and wildlife, be careful not to contaminate streams, lakes, or ponds with chemicals. Do not clean spraying equipment or dump excess spray material near such water. Avoid contaminating pasture grass or feed.

PLANT INDUSTRY STATION (Beltsville, Md.) and
CHAPMAN AND AROOSTOOK FARMS (Presque Isle, Maine)
R. V. Akeley, R. W. Buck, Jr., Lind Sanford, E. S. Schultz
F. J. Stevenson, Muriel J. O'Brien, and G. V. C. Houghland

Plant Industry Station

In 1966, in the greenhouses at the Plant Industry Station, Beltsville, Maryland, 68 parents were planted and about 140 seed lines of various combinations were obtained. The following horticultural characters were involved: skin color (white, red, russet, and yellow) tuber shape, depth of eye, high solids, processing qualities, yield, fertility, and maturity. Resistance to late and early blight; common and powdery scab; ring rot; leafroll and net necrosis; verticillium wilt; brown rot, corky ringspot; viruses A, X, Y, S, spindle tuber and resistance to insects and tuber-greening in combination with the horticultural characters were considered in making the crosses. In a new expansion of the program with major emphasis on insect resistance, seed was obtained from 51 crosses between parents with $2X = 48$ chromosomes and from 41 species crosses.

A relatively large number of new seedlings are grown in the greenhouses for increase in Maine and distributed to cooperators in states and upon request to cooperators in foreign countries. True seed is furnished to anyone requesting it.

Distribution

In 1966 shipments of varieties, advanced selections, new seedlings, and potato seed were sent to foreign countries and to a number of states. Summaries of these shipments are given in P.I. tables 1, 2, and 3. In many cases the identical stocks were sent to several cooperators so the tables give the total number of lots sent to each. The true seed, new seedlings and small quantities of named and numbered varieties were sent from the Plant Industry Station, but most of the larger shipments were made directly from the Aroostook Farm Presque Isle, Maine.

Distribution of various stocks to foreign countries is given in P.I. table 1. One hundred and six lots of named varieties, 37 lots of advanced selections and 3 lots of true seed of 15 progenies were sent in 19 shipments to foreign countries.

A total of 192 lots of named varieties and 713 lots of advanced selections were sent to 53 cooperators in 33 states (P.I. table 2).

The distribution of new seedlings is given in P.I. table 3. Seedlings of 403 progenies numbering 87,066 from the greenhouses at Beltsville and 12212 seedlings from 125 progenies from the Campbell Soup Company, Riverton, New Jersey, were distributed to 8 cooperators in 6 states. However, when the seedlings are harvested in the greenhouse the two best tubers are usually saved and numbered A and B. The A's are sent to one cooperator and the B's to another so there are many duplicates in the total numbers shown in the table.

Four hundred ninety-three seedlings from 17 progenies of haploids were sent by Roger Rowe from the Potato Introduction Station, Sturgeon Bay, Wisconsin to Maine for genetic and adaptability studies (P.I. table 3).

P.I. table 1. Distribution of varieties, advanced selections, and true seed to foreign countries. 1966.

Country	Cooperator	Lots of named Varieties	Lots of advanced Selections	True Seed	
		No.	No.	Progenies	Seeds
Argentina	Dr. A. V. Calderoni		6		
Brasil	Lucy Hemann			4	4000
"	Ted Kaminski			6	860
"	Joseph A. Roth			5	2950
Bulgaria	Acad. of Agri. Sci.	21			
Canada (BC)	A. R. Maurer		6		
Canada (Que)	Germain Bourassa	16			
Canada (NB)	Donald A. Young	1	4		
Canada (NB)	M. S. Cipar		4		
Canada (Man.)	J. A. Menzies	1	6		
Canada (Ont.)	Gary R. Johnston	1	2		
Finland	Dr. E. Varis	16	8		
Finland	Onni Pohjanheimo	21			
Germany	Dr. F. Grosimann	1			
Holland	Dr. J. A. Hogan Esch	1			
Israel	Mr. Edina Stein	11	1		
Nepal	G. R. Rajbhandary	13	9		
Russia	Request by H.L. Hyland	4			
South Africa		8			
Totals		115	46	15	7810

P.I. table 2. Distribution of named and numbered varieties to states. 1966.

States	Cooperators	Lots of named Varieties	Lots of advanced Seedlings
		No.	No.
Arizona	Norman F. Oebker	3	10
California	William R. Corrin		9
California	Glen N. Davis	8	20
Colorado	James Twomey		16
Connecticut	Arthur Hawkins	7	24
Delaware	E. P. Brasher	7	12
Florida	E. N. McCubbin	12	10
Idaho	J. Pavek		7
Indiana	John Bowers		2
Kansas	J. K. Greig		2
Louisiana	J. F. Fontenot		2
Maine	Tom Houghton		1
Maine	Frank Manzer		18
Maryland	Lind L. Sanford		14
Maryland	E. T. Matthews	3	6
"	Arthur Langford	3	6
"	Mac Ward	3	6
Massachusetts	Arnold Wolf	1	3
Michigan	N. R. Thompson		2

continued

P.I. table 2, continued.

Minnesota	O. C. Turnquist		2
"	G. R. Klacan	2	7
"	F. I. Lauer		18
Mississippi	H. C. Hammett	4	7
Missouri	V. N. Lambeth		2
Nebraska	R. B. O'Keefe		2
New Jersey	John C. Campbell	4	81
New Jersey	C. E. Cunningham	21	158
New York	Elmer E. Ewing	4	6
New York	Richard Sawyer	12	8
New York	Bob Cetas	7	21
Coop. Northeast yield, New York, West			
Virginia, Penna., North Carolina		3	9
North Dakota	R. H. Johansen		12
North Dakota	Ben Picha		3
Ohio	Floyd Lower	4	5
"	George Marlowe		2
"	V. E. Keirns		9
Oregon	J. Blaine Holladay	1	
Pennsylvania	Edward H. Landis	5	
"	James Watts		1
"	William Mills		11
"	E. F. Hoover	14	2
"	J. D. Harrington	28	11
Rhode Island	R. S. Bell		11
South Carolina	W. R. Sitterley	6	7
South Dakota	L. W. Carlson		2
Texas	J. M. Coruthers	7	3
"	Bruce A. Perry		15
"	" "	2	38
Virginia	M. M. Parker		22
Washington	R. R. Boyce	19	
"	Robert Kunkel	1	16
"	S. B. Locke	1	3
West Virginia	Mannon Gallegly		28
Wisconsin	Donald Kichefski		2
"	Wm. L. Beale		19
Total		192	713

P. I. table 3. Distribution of new seedlings from greenhouses. 1966.

State	Cooperator	Greenhouse			
		Beltsville, Md.		Riverton, N. J.	
		Progenies	Seedlings	Progenies	Seedlings
		No.	No.	No.	No.
Colorado	James Twomey	4	1246	72	5153
Maine	C. E. Cunningham			53	7059
Maine	Joe Akeley	153	39980		
"	"	17 ¹ / ₂	493		
"	G.V.C. Houghland	43	1855		
Maryland	Lind L. Sanford	43	2801		
North Carolina	Frank Haynes	33	4548		
West Virginia	Mannon Gallegly	40	23457		
Wisconsin	Wm. L. Beale	87	13179		
Totals		420	87559	125	12212

¹/₂ Haploid seedlings from Roger Rowe, Sturgeon Bay, Wisconsin.

Chapman Farm

Approximately 45,570 seedlings in 1965 and 1966 were grown in the greenhouses at Beltsville, Maryland, and Riverton, New Jersey, and were replanted for single-hill increase on the Chapman Farm. The germination of the single-hills was over 95%. Over 1,370 were selected at harvest for increase in 12-hill rows in 1966.

A summary of the maturity and fertility data on 895 seedlings grown in 12-hill rows in 1966 is given in P.I. table 4. Field maturity judgments were made by comparing the seedlings with the performance of Irish Cobbler (early), Chippewa (medium), and Green Mountain (late). About 26% of the 895 seedlings were rated as early, 54% as medium, and 20% late. Fertility was estimated by the number of seedballs produced per plant. Eighteen percent produced no seedballs, 14% produced a few, and 68% had many seedballs. In 1967, 126 of these seedlings will be grown in 60-hill plots for evaluation of yield, grade, specific gravity, chipping qualities, and resistance to several potato diseases.

P. I. table 4. Maturity and fertility of seedlings grown in 12-hill rows on Chapman Farm, 1966.

Maturity Classes	Seedlings		Fertility Classes	Seedlings	
	No.	Pct.		No.	Pct.
Early	233	26	None	162	18
Medium	482	54	Slight	123	14
Late	180	20	Good	610	68
Total	895			895	

Seventy seedlings were maintained as healthy seed sources that we think are virus free since their seed tubers were indexed for the presence of virus X and spindle tuber before planting. Under a similar system 80 seedlings were maintained in 20-hill rows as parents.

Over 150 seedlings were grown for increase in 60-hill rows and evaluated for appearance, yield, specific gravity, and chipping quality. Fourteen that rated 4.0 or lower for chip color after storage at 40° F. for 4 months and then re-conditioned for 2 weeks before frying are listed in P.I. table 5.

P.I. table 5. Chipping quality, specific gravity, yield of U.S. No. 1 tubers per acre, maturity, and overall tuber appearance of 14 selected seedlings, Presque Isle, Maine, 1966.

Seedling Number	Parentage	Chip Color 1/	Specific Gravity 2/	U.S.#1 Yield Per Acre	Matur- ity	Overall Appearance 3/
			Rating	Cwt.		
BR5946-9	B3401-25 x B5141-6	4.0	108	277	L	4
BR5960-5	B4808-19 x B5141-6	4.0	117	292	L	3
BR5960-9	" x "	4.0	112	216	M	3
BR5960-13	" x "	4.0	121	219	L	3
BR5967-7	B5016-2 x B5141-6	4.0	111	243	M	3
BR5975-4	B5052-7 x B5141-6	4.0	103	195	ME	3+
B6024-2	FI58-4 x B3692-4	3.0	98	243	L	4
B6024-3	" x "	3.0	111	281	ME	4
B6035-4	Merrimack x Ac.26055	4.0	108	223	E	3
B6039-1	Ac.26055 x B3692-4	4.0	109	274	ML	3
B6044-14	Ac.26121 x B5141-6	4.0	108	247	M	3+
B6097-9	B3692-4 x B5141-6	4.0	109	253	ML	3+
B6138-3	B5063-3 x B5141-6	3.0	84	210	M	2+
B6139-11	B5141-6 x B3692-4	4.0	116	275	L	3
B6140-3	B5141-6 x B5019-23	4.0	112	168	M	3+

1/ 1, very light to 10, very dark.

2/ 1.0 omitted from all ratings.

3/ 1 = poor tuber type to 5 = excellent.

Two acres of land were planted with 97 advance seedling selections. The number of hills grown per seedling varied from 100 to 4,800 hills. Twelve seedlings were rated at 6.0 or lower for chip color when held constantly at 50° F. for 4 months before chipping or when held at 40° F. and reconditioned for 2 weeks at 70° F.

Three selections in this group--B5036-50, B5066-3, and B5141-6--will be released as varieties sometime this year. Comparative data on yield, specific gravity, processing qualities, and disease resistance are presented in other sections of the Beltsville report and several others including the one for New Jersey (Campbell Soup) where dice firmness and translucency ratings are shown.

Aroostook Farm 1966

In 1966, six yield tests were grown on Aroostook Farm: Early and Medium Maturity; Late Maturity No. 1; Late Maturity No. 2; Date of Harvest; Five advanced seedling varieties compared for yielding ability, planted at three seedpiece spacings--8", 10", and 12"; and Campbell Soup Variety Test. The data for these tests are given in P. I. tables 6-12.

Early and Medium Maturity. Thirty-one numbered and named varieties were grown in the early and medium maturity yield test, P.I. table 6. The L.S.D. at the 5% level for this test was 58 cwt. per acre. Only one variety B5613-1 outyielded the early check Irish Cobbler and six were lower in yield. The other 24 were in the same class for yield as the Irish Cobbler.

The specific gravity of all varieties was relatively high. The L.S.D. for specific gravity was .008. Irish Cobbler had a specific gravity of 1.102. None of the others were higher, but 12 were in the same class.

Chip color was rated from 1 to 10, one being the highest and ten the darkest. Chips with a color of 7 or less would be commercially acceptable. The chips made from Irish Cobbler, the tubers of which were often stored at 50° F., were rated 7.6. Eighteen varieties produced chips with a lower rating than those produced from Irish Cobbler. B5463-1, Chippewa, and Monona rated less than 5 in color.

The tubers were rated for appearance in five classes: 1 = poor to 5 = very good. The tubers of the 31 varieties ranged from 2 to 4. Twenty-five were intermediate in appearance rating 3 or 3+.

P. I. table 6. Early and Medium--Maturity Yield Test, Aroostook State Farm, Presque Isle, Maine, 1966

Variety	Yield U.S. No. 1		Specific Gravity ^{1/}	Chip Rating ^{2/}	Tuber Rating ^{3/}
	Tubers Per Acre				
	Cwt.	Pct.			
B5042-2	311	94	109	7.3	3
B5326-8	368	98	88	7.0	3+
B5131-2	320	95	101	6.6	3
B5288-5	330	89	82	8.9	3+
B5089-16	282	84	93	7.1	3+
B5398-4	243	82	100	8.3	3+
B5400-8	318	86	104	7.1	3
B5410-26	325	91	89	7.8	3
B5412-10	289	97	88	8.5	2
B5422-9	357	93	95	7.3	3
B5433-8	248	88	83	9.0	3
B5463-1	276	94	89	4.5	3
B5463-15	346	94	88	7.1	3+
B5598-3	323	88	89	9.0	4
B5613-1	412	95	98	6.0	3
B5630-1	390	93	90	8.4	3
B5647-9	306	82	93	5.6	3
B5658-1	364	94	85	8.5	4
B5669-4	312	94	95	9.1	3+
B5680-1	367	90	107	6.4	3
B5683-2	299	82	86	9.8	3

continued

P.I. table 6, continued.

B5696-6	231	79	97	3.7	3
B5701-2	368	94	91	7.5	3
B5704-3	195	73	93	7.1	2
Chippewa	303	91	92	4.0	3
I. Cobbler	339	90	102	7.6	2
Pungo	388	97	107	7.8	3
Chieftain	348	89	93	9.6	4
54W14-1	278	92	109	5.9	3
Monona	285	93	90	4.2	3
High Plains	359	88	96	5.8	3
LSD 5%	58		08		

1/ 1.0 omitted from all ratings.

2/ Held at 50° F. constantly from harvest in September to January 19.

3/ 1 = poor to 5 = very good appearance.

Late-Maturity Yield Test No. 1. Thirty-three varieties including Katahdin and Kennebec were planted in the late maturity yield test No. 1, P.I. table 7. The LSD between means at the 5% level was 59 cwt. per acre. B4784-1, B5585-5, B5598-2, B5604-1, B5617-5, B5683-5, B5643-3, B5694-1, B5696-1, B5696-3, B5696-4, and Kennebec outyielded Katahdin but only B4784-1, B5643-3, and B5696-3 outyielded Kennebec significantly. Three varieties were lower than Katahdin in yield.

The LSD for specific gravity at the 5% level was .008. Katahdin had a specific gravity of 1.087, Kennebec 1.090. B5459-1, B5591-1, B5617-5, B5664-4, B5665-7 were higher in specific gravity than Katahdin and 7 varieties were significantly lower.

The color of chips made from the 33 varieties ranged in rating from 3.5 to 9.8. Chips made from B5458-6, B5585-7, B5598-2, B5617-5, B5664-4, B5665-7, B5675-5, B5676-2, B5687-9, B5687-12, B5691-2, B5696-1, B5698-8 and Kennebec would be commercially acceptable.

The chips made from Katahdin rated 7.6. The tuber rating ranged from 2 to 5. B4784-1, B5665-7, B5643-3, B5691-2 rated 2 or 2+. Twenty-two varieties rated 3 or 3+. Five varieties rated 4 and one variety, B5052-7, rated 5.

P.I. table 7. Late-Maturity Yield Test No. 1. Aroostook State Farm, Presque Isle, Maine, 1966.

Variety	Yield U.S. No. 1 Tubers Per Acre	Specific Gravity ^{1/}	Chip Rating	Tuber Rating
	Cwt.	Pct.		
B5052-7	376	96	9.2	5
B5299-39	424	97	7.9	3+
B4784-1	565	96	9.8	2
B5458-6	345	96	4.9	3
B5459-1	368	96	7.5	3+
B5459-7	365	77	9.2	3
B5585-5	461	93	8.5	3

continued

P. I. table 7, continued.

B5585-7	349	92	75	6.1	4
B5591-1	419	93	97	8.8	3
B5593-1	416	95	82	7.6	4
B5594-3	286	89	76	7.7	3
B5598-2	484	96	82	5.9	4
B5604-1	437	94	86	7.2	3+
B5617-5	463	96	104	5.6	3+
B5635-9	317	91	91	7.9	3
B5647-8	362	92	77	7.4	3
B5664-4	334	95	100	5.4	3
B5665-7	358	94	99	3.5	2+
B5675-5	314	94	81	6.7	3+
B5676-2	384	97	91	5.5	3
B5683-5	464	90	84	7.2	3
B5643-3	542	98	79	9.7	2+
B5687-9	278	96	90	7.0	3
B5687-12	400	98	84	6.8	3
B5690-5	330	88	83	8.8	3+
B5691-2	308	89	85	5.4	2+
B5694-1	439	97	86	8.8	4
B5696-1	458	95	82	6.9	3+
B5696-3	512	97	84	8.7	3
B5696-4	406	96	91	8.2	3
B5698-8	385	89	84	6.1	4
Katahdin	370	95	87	7.6	3+
Kennebec	434	98	90	5.9	4
LSD 5%	59		08		

1/ See footnotes table 6.

Late-Maturity Yield Test No. 2. Twenty-six named and numbered varieties were included in this test, P.I. table 8. The LSD for yield at the 5% level was 57 cwt. per acre. B5700-1, B5701-4, B5701-5, B5703-5, B5718-6, B5718-22, B5736-3, B5755-3, 48-1, Kennebec, and Grand Falls outyielded Katahdin, but only one, B5703-5, outyielded Kennebec.

The LSD for specific gravity at the 5% level was .008. The specific gravity of Katahdin was 1.089. Two varieties--B5712-5 and Grand Falls--were higher in specific gravity than Katahdin but only 4 varieties were significantly lower.

The color of the chips made from the 26 varieties after storage at 50° F. ranged from 4.0 to 9.4. Chips made from B5700-4, B5702-1, B5712-5, B5718-16, B5733-4, B5735-5, B5755-7, B1688-2, Kennebec, Grand Falls, and Platte would be commercially acceptable.

The tuber rating ranged from 2+ to 4. Twenty-two of them rated 3 or 3+ which would indicate that they were intermediate for appearance.

P.I. table 8. Late-Maturity Yield Test No. 2, Aroostook State Farm, Presque Isle, Maine, 1966.

Variety	Yield U.S.No. 1 Tubers Per Acre		Specific Gravity	Chip Rating	Tuber Rating
	Cwt.	Pct.			
B5699-3	398	90	77	9.4	3
B5700-1	473	95	87	9.0	3+
B5700-4	435	98	75	6.4	3
B5701-4	455	95	68	7.2	4
B5701-5	493	97	81	9.0	3+
B5701-23	408	93	88	7.7	3
B5702-1	356	93	79	2.7	3
B5703-5	533	97	88	8.0	4
B5712-5	413	93	102	7.0	3
B5716-5	408	94	86	7.7	3+
B5718-6	467	94	81	8.9	3
B5718-16	277	83	89	6.1	3+
B5718-22	464	94	85	8.6	3
B5733-4	432	93	88	6.6	3
B5735-5	299	77	86	4.0	3
B5736-3	468	92	87	8.2	3+
B5740-2	351	80	82	7.7	3
B5755-3	447	96	87	9.2	3
B5755-7	397	93	86	6.9	3+
B5755-8	362	93	87	7.1	3
B1688-2	281	80	90	6.1	3
Katahdin	385	95	89	8.7	3+
Kennebec	463	97	92	4.7	4
Grand Falls	476	97	98	4.3	3
Platte	440	94	81	6.3	3
48-1	505	93	91	7.6	2+
LSD 5%	57		08		

1/ See footnotes table 6.

Date of Harvest. Six varieties were harvested on three dates--August 22, September 6, and September 20. The data for U.S. No. 1 yields and specific gravity are given in P.I. table 9. The mean ratings for chip color made after storage at 50° F. are given in P.I. table 10.

B5036-40 and Kennebec produced high yields on August 22. Both were significantly higher than Katahdin on all 3 dates. Ona and B5141-6 produced a significantly lower yield than Katahdin on August 22 and September 6 but only B5141-6 produced a lower yield than Katahdin on September 20.

The specific gravity data are interesting. B5141-6 was significantly higher than all the others for all 3 dates, 1.101, 1.114, and 1.118. The specific gravity of the 5 others ranged from 1.075 to 1.078 when harvested August 22 but there was a highly significant increase in this character in all varieties in the following two weeks. However, there was no difference on the average specific gravity of the tubers harvested September 6 or September 20.

The color of the chips made from all six varieties harvested all 3 dates stored at 50° were commercially acceptable with two exceptions--Katahdin and Ona harvested August 22. Monona produced the lightest colored chips on the average for all 3 dates of harvest.

Only 2 varieties--B5141-6 and Monona--produced chips with acceptable color when harvested September 22. The chips of Ona harvest October 6 were too brown for commercial acceptance on most markets, the chips of the other 4 were O.K. and the chips from all 5 varieties possessed acceptable color when the potatoes were harvested October 20.

P. I. table 9. Date of Harvest Yield Test, Aroostook State Farm, Presque Isle, Maine, 1966.

Variety	Yield Per Acre in Cwt.				Specific Gravity			
	(U. S. No. 1)							
	8-22	9-6	9-20	Mean	8-22	9-6	9-20	Mean
B5036-40	321	340	385	349	75	97	93	88
B5141-6	187	197	221	202	101	114	118	111
Katahdin	238	288	294	273	77	95	92	88
Kennebec	332	355	373	353	78	90	91	86
Monona	266	290	306	287	76	86	87	83
Ona	200	245	293	246	76	93	96	88
Mean	257	286	312		80	96	96	
LSD 5%	30	30	30	30	6	6	6	6

P. I. table 10. Color of chips made from the tubers of 6 varieties produced in the date of harvest test. Chips made from tubers direct from 50° F. storage, and 40°, cured at 70°. Potatoes harvested on 3 dates--August 22, September 6, and September 20.

Variety	Harvest Dates				Harvest Dates			
	8-22	9-6	9-20	Mean	8-22	9-6	9-20	Mean
	(50° F. Constant)				(40-70° F.)			
B5036-40	6.7	4.0	4.4	5.0	8.7	6.2	5.5	6.8
B5141-6	4.4	4.5	5.0	4.6	5.2	4.8	4.8	4.9
Katahdin	7.4	4.2	5.2	5.6	8.2	5.7	5.9	6.6
Kennebec	6.8	3.5	4.3	4.9	7.4	4.6	4.6	5.5
Monona	3.6	3.9	3.1	3.5	5.0	3.8	4.0	4.3
Ona	8.6	6.7	5.7	7.0	9.5	7.8	6.8	8.0

Seed Piece Spacing. Five seedling varieties were planted to test their yields when the seed pieces were planted 8 inches, 10 inches, and 12 inches apart in the rows. The results are given in P. I. table 11.

The yield of B4829-7 with the seed pieces planted 8 inches apart, was higher than when the seed pieces were spaced either at 10 inches or 12 inches. There was not a significant difference between the yields of the 10-inch and 12-inch plantings. The yields of B5141-6 and B5132-3 did not differ significantly for any of the three spacings. The yields of B5066-3 and B5036-40 did not differ

significantly at either the 8-inch or the 12-inch spacing but for some reason the 10-inch spacing of these two varieties produced the lowest yield.

The mean yield for the 5 varieties was somewhat higher when the seed pieces were spaced 8 inches apart but this was due to the response of one seedling, B4829-7. With 4 out of the 5 seedlings the 12-inch spacing was as good as any and required less seed stock to plant.

P.I. table 11. Five seedling varieties with three seed-piece spacings compared for Yield Ability, Aroostook State Farm, Presque Isle, Maine, 1966.

Spacing	Seedlings Yield in hundredweight per acre, U.S. No. 1 Tubers					Mean
	B4829-7	B5141-6	B5066-3	B5036-40	B5132-3	
8 inches	425	246	344	425	329	354
10 "	383	255	296	381	326	328
12 "	353	227	344	414	308	329
Mean	357	243	328	407	321	
LSD 5%	32	32	32	32	32	15

Campbell Soup Yield Test. Twenty-three seedlings and 6 named varieties were grown in a yield test on the Aroostook Farm, P.I. table 12. B5036-40, B5415-6, B5422-10, Kennebec, Pennchip, and Keswick outyielded Katahdin. B5000-18, B5141-6, B5253-31, B5301-7, B5281-1, B5286-24, B5415-13, B5446-4, Cherokee, and B4469-7 produced yields significantly lower than that of Katahdin. The other 13 were in the same yield class as Katahdin.

The specific gravity was relatively high for all varieties. Katahdin had a specific gravity of 1.094. B5141-6 (1.114), B4469-7 (1.108), and Cherokee (1.099) were significantly higher than Katahdin in specific gravity. Twelve varieties were lower and the others were not significantly different from Katahdin.

If chip color rated less than 7 is considered commercially acceptable, the chips made from 18 of these varieties direct from 50° F. storage would qualify. The lightest colored chips with a rating of less than 3 were made from B5132-3, B4469-7, Kennebec, and Pennchip.

The ratings for tuber appearance ranged from 2+ to 4 with 24 varieties rating 3 or 3+. The tubers of Keswick had the lowest rating of 2+.

P.I. table 12. Campbell Soup Yield Test, Aroostook State Farm, Presque Isle, Maine, 1966.

Variety	Yield U.S. No. 1 Tubers Per Acre		Specific Gravity ^{1/}	Chip Rating	Tuber Rating
	Cwt.	Pct.			
B4829-7	342	96	82	7.3	3+
B5000-18	281	91	89	4.6	3
B5036-40	403	97	96	5.3	3
B5066-3	364	96	83	7.3	3+
B5141-6	263	88	114	4.0	3
B5253-31	278	91	89	9.8	3+
B5132-3	353	90	92	2.7	3+
B5282-13	353	93	97	3.5	3

continued

P. I. table 12, continued.

B5287-16	357	94	83	6.5	3+
B5301-7	276	93	86	6.0	3
B5281-1	285	84	88	6.3	4
B5286-24	292	88	92	6.0	4
B5408-2	341	91	82	7.6	3+
B5415-6	386	97	98	7.0	3
B5415-13	275	93	93	7.8	3
B5421-3	356	96	86	7.1	3
B5422-6	368	96	91	6.2	3+
B5422-10	378	98	90	4.7	4
B5446-4	299	92	83	8.2	3+
B5458-3	330	97	87	7.7	3+
B5461-4	325	93	90	3.0	3
Katahdin	340	95	94	4.8	3
Kennebec	400	97	95	2.0	3
Cherokee	291	91	99	3.8	3
Pennchip	380	95	94	2.0	3
Norgold Russet	303	86	89	8.2	4
Keswick	387	97	98	6.3	2+
B725-61	364	95	92	6.3	3
B4469-7	274	96	108	2.5	3
LSD 5%	37		04		

1/ See footnotes table 6.

Solanum Species and Hybrids

R. W. Buck, Jr.

Forty diploid species were grown at Beltsville, Maryland, in 1966 for crossability investigations. Seed was obtained from 39 interspecific crosses among the diploid species.

Fifteen diploid hybrid progenies with S. verrucosum as the female parent were grown. Nine of the progenies were male sterile. Seed was obtained by backcrossing to the male parent in eight of these progenies. One progeny was successfully backcrossed to S. verrucosum.

Three diploid progenies involving S. chacoense and species of Series Megistacroloba were grown. Two progenies were male sterile. All progenies were successfully backcrossed to both parent species, and the male fertile progeny produced F₂ seed from sib-matings.

F₂ seed was obtained from selfing in 7 tetraploid hybrid progenies from 4N x 4N matings. One progeny, S. acaule x S. stoloniferum failed to produce F₂ seed.

F₃ seed was obtained by selfing 6 tetraploid F₂ hybrid progenies.

Chromosome behavior was normal in the majority of diploid species and hybrids investigated. One triploid plant was found in the progeny of a cross between two diploid species.

INSECT INVESTIGATIONS

L. L. Sanford and J. P. Slesman

A trial was conducted at the Ohio Agricultural Research and Development Center, Wooster, Ohio in which 14 varieties and selections were compared in their reactions to the potato leafhopper (Empoasca fabae) and to the potato flea beetle (Epitrix cucumeris).

A split plot design, in which each clone was planted in two whole plots, was used; one whole plot was treated with the systemic insecticide Temik at 3 pounds actual per acre, and the other was left untreated. The insecticide was placed in the furrow at planting time (May 4). Each split plot (clones) contained 15 seedpieces spaced 12 inches apart in 36-inch rows. Whole plots were replicated 4 times.

Rainfall was below average in June and July but near average in August and September. No fungicide treatments were necessary and no other insects were present in large enough numbers to confound the results.

During the growing season hopperburn injury was measured twice, August 4 and September 4; leafhopper nymphal populations (per plant) were estimated on July 25; and the number of punctures (per 20 leaflets) caused by flea beetles was estimated on July 5. Harvest date was September 19.

Results. The systemic insecticide was nearly 100 percent effective against infestation by the potato leafhopper in the treated plots throughout the entire growing season. Infestation by flea beetles was much reduced but not eliminated.

The yields of untreated plots averaged 54% lower than treated plots; however, yield reductions ranged from 34-70% (P.I. table 13). This wide range was statistically reflected in a significant ($P < .01$) interaction between clones and treatments. A low yield reduction figure probably is related to some type of clonal resistance or to early maturity in some cases, eg. Cobbler.

For the 14 clones in this test, hopperburn injury (P.I. table 14) was highly correlated with yields in untreated plots ($r = -0.96$ and -0.92 , $P < .01$) and with untreated/treated yield ratios (-0.76 , $P < .01$). The correlation value between nymphal population count (P.I. table 14) and untreated yield was -0.57 ($P < .05$); between nymphal population count and untreated/treated yield ratio $r = 0.12$ (N.S.); between nymphal population count and hopperburn injury $r = 0$. Hence, the size of the nymphal population on any one of these 14 clones does not necessarily indicate its resistance or susceptibility as might be measured by hopperburn injury or the untreated/treated yield ratio.

Significant differences between clones were found for damage by flea beetles (P.I. table 15), although the differences were not always the same in the treated and untreated plots as is reflected by the presence of a significant interaction ($P < .025 < .01$) between clones and treatment.

The correlation of flea beetle damage with hopperburn injury and leafhopper nymph count was low and non-significant. The association between flea beetle damage and yield reduction for these 14 clones was relatively low ($r = -0.48$, N.S.).

P.I. table 13. Total yields for 14 clones grown at Wooster, Ohio, 1966.

Rank	Treated		Untreated		Yield Ratio Untreated/Treated
	Clone	Cwt.	Clone	Cwt.	
1	B5131-2	369	Sequoia	236	.66
2	B5090-11	363	B5052-7	214	.64
3	Sequoia	356	B5131-2	179	.52
4	B5052-7	333	B5066-3	158	.49
5	B5282-13	332	Cobbler	143	.48
6	Cobbler	318	B5036-40	134	.48
7	B5066-3	316	Monona	131	.46
8	B5036-40	312	B4829-7	125	.45
9	B5088-7	310	B5287-16	110	.44
10	B4829-7	286	B5090-11	109	.43
11	Monona	282	B5282-13	106	.42
12	B5301-7	250	B5088-7	105	.34
13	B5287-16	227	B5301-7	105	.32
14	B5000-18	199	B5000-18	94	.31
LSD .01		41		41	.14
LSD .01 Between treatments of the same or different clones.					

P.I. table 14. Hopperburn injury and leafhopper nymphal counts for 14 clones grown at Wooster, Ohio, 1966. 1/

Hopperburn 2/							
August 4				September 4			
Clone	Mean Score	Defoli-	Mean Score	Defoli-	Clone	No. Nymphs Per 10 Plants	
		ation		ation		Actual Count	Sq. Root of Count
		Pct.		Pct.			
B5052-7	1.0	2	2.2	7	B5287-16	41	6.42
Sequoia	1.0	2	3.2	14	B5301-7	47	6.86
B5131-2	3.0	12	5.5	50	B5052-7	50	7.09
B5036-40	4.0	23	5.5	50	Monona	67	8.19
Monona	4.2	26	6.2	63	B4829-7	68	8.28
B5066-3	4.5	31	7.5	83	B5090-11	84	9.17
Cobbler	4.7	35	7.0	76	B5131-2	90	9.48
B5301-7	5.2	44	9.0	94	B5282-13	91	9.99
B4829-7	5.2	44	8.7	92	B5000-18	134	11.56
B5088-7	5.2	44	9.0	94	B5066-3	138	11.75
B5282-13	5.2	44	8.7	92	B5036-40	165	12.85
B5287-16	5.2	44	9.0	94	Sequoia	187	13.66
B5090-11	5.7	54	8.5	91	Cobbler	187	13.66
B5000-18	6.5	69	9.0	94	B5088-7	320	17.90
LSD .01	0.9		2.9				3.95

1/ Data recorded from untreated plots; treated plots, were not infested with leafhoppers.

2/ Hopperburn injury measured by the Barratt and Horsfall system of rating plant diseases (Phytopath. 35:655, 1945).

P.I. table 15. Fleabeetle damage measured on 14 clones grown at Wooster, Ohio, 1966.

Rank	Clone	Treated		Clone	Untreated	
		Mean No. Punctures/20 Leaflets	Sq. Root Transfor- mation		Mean No. Punctures/20 Leaflets	Sq. Root Transfor- mation
1	B5066-3	63	7.95	B5282-13	629	25.09
2	B4829-7	92	9.58	B5052-7	631	25.12
3	B5282-13	97	9.86	Sequoia	648	25.45
4	B5052-7	106	10.29	B5066-3	702	26.51
5	B5301-7	110	10.47	B5088-7	755	27.48
6	Cobbler	115	10.73	Cobbler	795	28.19
7	B5131-2	140	11.82	B482-7	804	28.36
8	Sequoia	148	12.18	B5090-11	876	29.60
9	B5287-16	168	12.98	B5131-2	888	29.80
10	B5088-7	185	13.59	B5000-18	908	30.13
11	B5036-40	196	14.01	B5287-16	917	30.39
12	B5090-11	204	14.31	B5036-40	967	31.10
13	B5000-18	268	16.36	Monona	1148	33.88
14	Monona	273	16.53	B5301-7	1150	33.91
	LSD .01		4.87			4.87
	LSD .01	Between treatments of the same or different clones.				

POTATO DISEASE INVESTIGATIONS

W. B. Raymer, Muriel J. O'Brien, R. J. Young, E. S. Schultz,
R. V. Akeley, and R. W. Buck, Jr.

Forty-seven advance seedling selections and several varieties, as checks, were planted in replicated plots and screened for resistance to 11 potato diseases in 1966 (P.I. table 16) in order to recheck their reactions to these diseases.

Resistance to Ring Rot. The 47 seedling varieties were subjected to a ring-rot test. Five plants of each seedling were replicated four times in a field plot. The three checks, similarly replicated, were WY1122, B3478-45, and Teton variety.

Before planting, freshly-cut seed pieces of all varieties were dipped in a heavy suspension of the ring-rot bacterium [*Corynebacterium sepedonicum* (Spieck. & Kotth.) Skapt. & Burkh.] and planted immediately. Readings were made on vine symptoms in August.

B5052-7 showed no vine symptoms, and seedlings B4829-7 and B5000-18 had one plant each infected out of 20 examined. Forty-one seedlings were totally susceptible.

Resistance to Common Scab. In 1966 scab data were obtained on 47 seedling varieties. Three hills of each variety was planted, replicated 3 times, along with similar replications for the check varieties Cherokee, Chippewa, Kennebec, and Green Mountain. Green Mountain variety was also planted every third row as a check row. These data are summarized in P.I. table 17.

Nine of the 47 seedlings had less than 1% of the tuber surface covered with small, superficial scab pustules. All susceptible check varieties were in the same class with surface-area rating of 3 and the pustule-type rating of 3 or 4.

P.I. table 17. Summary of 1966 data on common-scab test, Aroostook Farm, Presque Isle, Maine.

Figures represent: Average reading for 3 hills in 3 replications for 47 varieties and 4 check varieties.

	Total Surface Area Covered ^{1/}					Pustule Type ^{2/}			
	T	1	2	3	4	1	2	3	4
Seedling varieties (47)	9	8	17	13	0	6	9	20	12
<u>Checks</u>									
Cherokee (3)	0	0	3	0	0	0	0	3	0
Chippewa (3)	0	0	0	3	0	0	0	3	0
Kennebec (3)	0	0	0	3	0	0	0	0	4
Green Mountain (3)	0	0	0	3	0	0	0	0	4

^{1/} Surface area covered: T = trace, less than 1%; 1 = 1-20%; 2 = 21-40%; 3 = 41-60%; 4 = 61-80%.

^{2/} Type of pustule: 1 = small, superficial; 2 = large but still superficial; 3 = large, rough pustules; 4 = large, rough pustules, deeply pitted.

Verticillium Wilt Resistance. Verticillium wilt disease data were obtained on reaction of 47 seedling varieties and 3 check varieties. The test varieties, in sets of 5 plants each, were replicated 4 times. Checks used were varieties Chippewa, Kennebec, and Houma.

The method of inoculation was to cut seed tubers, dip them in a slurry of Verticillium albo-atrum Reinke & Berth. and plant them immediately. The land used for this test was known, from previous tests, to be heavily infested with wilt organisms.

The reading was made on vine symptoms. No variety tested escaped infection. Seedling B5415-6 was least susceptible with 1 plant out of 20 infected. Most susceptible seedlings were B5459-7 with 15 out of 20 plants infected and B5288-5 with 16 out of 20 plants diseased.

Resistance to Leafroll Virus. The 47 seedling varieties to be tested were subjected to a leafroll virus-resistance test in the field. Five plants of each variety were replicated 4 times in the plot. Every third row was planted to leafroll-infected Katahdin variety. Check varieties in the replicated plot included Green Mountain, Katahdin, and Mohawk.

The green peach aphid, Myzus persicae Sulz., was reared in cages on leafroll-infected Katahdin plants. These viruliferous aphids were then taken to the field, and 10-12 aphids were placed on the leaves of each test plant and also on all plants of every third infector row. After a period of colonization, readings were made on vine symptoms.

Seedling B5031-18 was completely resistant to the leafroll virus, and six other seedlings possessed a high degree of resistance (P.I. table 16). Thirty-four seedlings were totally or almost totally susceptible. Six varieties ranged in susceptibility from 25 to 75%.

Resistance to Net Necrosis and Stem-end Browning. In 1966, 47 seedling selections and 3 check varieties, Green Mountain, Mohawk, and Katahdin, grown in 5-hill plots replicated 4 times, were tested at Aroostook Farm for resistance to net necrosis and stem-end browning. Tubers, grown in 1965 at Chapman Farm, were planted, harvested in September, then stored at 50° F. for three months.

Upwards of 100 tubers per seedling were cut after the three-month storage period and examined for symptoms of net necrosis and stem-end browning. Ten seedling selections had no net necrosis and of these ten, 7 also showed no stem-end browning. In total, twenty-nine seedlings were free from stem-end browning. Of the checks, Green Mountain showed 35.1% net necrosis, Mohawk 43.6%, and Katahdin, 2.7%. All checks were free of stem-end browning.

Resistance to Virus X. Two tests for resistance to virus X are used. The first test is a sap-inoculation test with a virulent strain of X in Katahdin. All survivors of this test are then tested on Gomphrena globosa L. to check their freedom from virus X.

The 47 seedlings were tested by sap-inoculation in two replications. Thirteen were resistant to virus X.

Resistance to Virus A. Aphid-inoculation tests were carried out as in previous years with virus A-infecter plants between the second and third plants of each 4-hill test lot, replicated 3 times and rows of infecter plants set every third row. Aphids reared on Green Mountain infected with mild mosaic were introduced at an early stage of plant growth.

Only one seedling, B5446-4, of the 47 seedlings tested in the field showed presence of virus A under field conditions. When these seedlings were grown in the greenhouse in the winter of 1966-1967 at Beltsville, Maryland, 14 proved to be graft-susceptible when they were grafted with seedling 41956 carrying virus A. In this greenhouse test one seedling was missing and one reading was questionable. Thirty-one seedlings, or 65.5% of the population, were graft-immune. These tests indicate the high level of virus-A resistance now present in the current breeding program.

Resistance to Virus Y. Field resistance to aphid inoculation with virus Y was determined on 47 seedlings planted in 3-hill plots replicated 3 times with infecter plants between hills two and three in each plot. Aphids reared on rugose mosaic-infected Green Mountain plants grown in the greenhouse were introduced into the test plots. Ten to twelve viruliferous aphids were placed on seedlings. Five varieties were resistant, or 10.6% of the population. No graft-resistance test is applied to virus Y.

Resistance to Race O of Late Blight. Tests for resistance to late blight in the USDA program are conducted under three methods, viz., (a) field tests with Race O on Arcostook Farm, Maine; (b) determination of major R gene content on detached leaves at Orono, Maine; and (c) tests for multigenic field resistance in plantings made in Maine in isolated field plots. Dr. M. E. Gallegly of West Virginia is a cooperator with us on this project. The report for this year will cover only the data for category (a).

The 47 seedling varieties, replicated twice in 2-hill plots, were planted at Arcostook Farm. The susceptible Green Mountain was planted every third row, and as a border row around the test plot. Zoospore suspensions of Race O of Phytophthora infestans (Mont.) D By. were sprayed over the leaves of test and check plants in the early evening hours at regular intervals during July and August. Readings were made on foliage symptoms starting at the first incidence of blight and continuing until the plants were dead.

Of the 47 seedlings tested 26 showed a high degree of resistance, 19 had no resistance, and 2 plants were missing (P.I. table 16). The scale for resistance/susceptibility is 0 (no blight) to 6 (plants dead).

Multiple Disease Resistance. The seedlings in P.I. table 16 possess two or more disease-resistant factors. Seedling B5422-10 is a good example of one that has six disease-resistant factors combined with high yield (378 cwt. per acre) and fair chipping color (6.0).

P.I. table 16. Seedling evaluation for disease resistance at Presque Isle, Maine, and Beltsville, Maryland, 1966.

Pedigree Number	Ring Rot ¹ /	Scab A T	Vert. Wilt ¹ /	Leaf- roll ¹ /	Net Nec ¹ /	Stem-end Browning ¹ /	Viruses				Late Blight
							X	Af	Ag ² /	Y	
B4784-1	20/20	1-2	9/20	20/20	7/79	0/79	S	R	R	S	1
B4829-7	1/20	2-3	5/20	20/20	12/60	0/60	S	R	R	S	1
B5000-18	1/20	3-4	8/20	20/20	2/86	0/86	S	R	R	S	1
B5011-17	20/20	2-3	4/20	19/20	0/59	1/59	S	R	S	S	6
B5031-18	20/20	2-3	11/20	0/20	2/79	0/79	S	R	S	S	6
B5036-40	20/20	1-3	8/20	20/20	6/64	1/64	R	R	S	S	1
B5042-2	20/20	3-4	6/20	14/20	6/64	4/64	S	R	S	R	6
B5052-7	0/20	2-3	4/20	20/20	1/48	3/48	S	R	R	S	1
B5066-3	6/20	1-2	12/20	20/20	3/66	3/66	S	R	S	S	1
B5088-7	6/20	1-3	14/20	20/20	11/81	1/81	S	R	R	R	
B5089-18	20/20	1-2	9/20	18/20	3/85	0/85	S	R	S	S	1
B5090-11	20/20	3-3	11/20	20/20	0/63	0/63	S	R	S	S	1
B5131-2	20/20	2-4	6/20	20/20	4/71	1/71	R	R	R	S	1
B5132-3	14/20	T-2	3/20	20/20	2/74	0/74	S	R	R	S	6
B5141-6	20/20	3-4	9/20	20/20	0/64	0/64	S	R	R	S	1
B5236-8	19/20	T-1	6/20	7/20	6/60	0/60	S	R	R	S	6
B5253-31	18/20	3-4	7/20	1/20	0/60	0/60	S	R	R	S	6
B5267-2	20/20	2-3	8/20	4/20	2/73	0/73	R	R	R	S	6
B5281-1	20/20	T-1	14/20	20/20	10/79	2/79	R	R	R	S	1
B5282-13	20/20	2-3	7/20	20/20	9/64	2/64	R	R	R	S	6
B5286-24	20/20	1-2	11/20	20/20	10/94	1/94	R	R	R	S	1
B5287-16	20/20	3-4	15/20	15/20	3/55	0/55	R	R	R	S	6
B5288-5	20/20	2-3	16/20	20/20	3/80	0/80	S	R	R	R	1
B5299-39	20/20	3-4	3/20	1/20	2/56	5/56	S	R	R	S	6
B5301-7	20/20	2-2	10/20	20/20	0/68	0/68	S	R	R	S	1
Chieftain	20/20	2-3	7/20	19/20	3/87	0/87	S	R	S	S	1
B5398-4	20/20	T-1	3/20	19/20	4/66	1/66	S	R	R	S	1
B5400-8	20/20	3-4	9/20	6/20	5/82	2/82	R	R	R	S	6
B5408-2	20/20	T-2	4/20	14/20	4/53	0/53	S	R	R	S	1
B5410-26	16/20	2-2	5/20	15/20	9/78	1/78	S	R	?	S	1
B5412-10	20/20	T-1	2/20	20/20	5/57	0/57	S	R	S	S	5
B5415-6	20/20	2-3	1/20	2/20	0/48	0/48	S	R	S	S	6
B5415-13	20/20	3-4	3/20	12/20	0/45	3/45	S	R	S	S	6
B5421-3	20/20	3-4	3/20	20/20	0/53	0/53	S	R	R	S	1
B5422-6	20/20	2-2	13/20	20/20	0/86	0/86	R	R	S	R	1

P. I. table 16, continued.

Pedigree Number	Ring Rot ¹ / ₁	Scab A T	Vert. Wilt ¹ / ₁	Leaf- roll ¹ / ₁	Net ¹ / Nec ¹ / ₁	Stem-end ¹ / Browning ¹ / ₁	Viruses				Late Blight
							X	Af	Ag ² / ₁	Y	
B5422-9	20/20	3-4	4/20	17/20	10/55	0/65	S	R	R	S	1
B5422-10	19/20	2-3	11/20	20/20	0/66	2/66	R	R	R	R	1
B5433-8	20/20	T-1	4/20	20/20	4/58	0/58	S	R	S	S	6
B5446-4	20/20	T-3	4/20	20/20	7/80	0/80	S	S	S	S	1
B5458-3	20/20	2-3	2/20	12/20	2/54	0/54	S	R	R	S	1
B5458-6	20/20	T-1	6/20	2/20	2/58	0/58	R	R		S	6
B5459-1	20/20	3-3	9/20	18/20	14/80	0/80	S	R	R	S	6
B5459-7	20/20	2-3	15/20	17/20	2/74	0/74	R	R	R	S	1
B5461-4	19/20	1-3	3/20	20/20	6/65	0/65	S	R	R	S	1
B5463-1	20/20	3-4	14/20	19/20	1/70	0/70	R	R	R	S	6
B5463-15	20/20	2-3	10/20	20/20	8/71	0/71	S	R	R	S	6
B4469-7	20/20	1-3	3/20	20/20	4/38	0/38	S	R	R	S	
Green Mt.				20/20	26/74	0/74	S	S	S	S	
Katahdin				20/20	2/74	0/74	S				
Mohawk				20/20	24/55	0/55	S			S	
Wy1122	0/20										
B3478-45	0/20										
Teton	1/20										
Cherokee		2-3									
Chippewa		3-3	8/20								
Kennebec		3-4	7/20								
Houma			1/20								

¹/ Fraction equals number infected/number examined.

²/ Af indicates field resistance and Ag graft resistance.

INTER-REGIONAL POTATO INTRODUCTION PROJECT (IR-1)

P. R. Rowe and R. W. Ross

One-hundred seventy-five new stocks were received from 15 countries. Requests have been sent for species that are either absent or in short supply in the Collection.

Approximately 90% of the species introductions are being maintained as true seed. Seed germination tests were carried out for 879 seed lots 2-16 years old. Recently harvested seed samples of 144 introductions were sent to the National Seed Storage Laboratory, Fort Collins, Colorado. Three-hundred sixty clonal selections were indexed for viruses A, X, and Y.

An addition of 480 square feet of work space to the Potato Storage and Laboratory Building has been completed to facilitate seed extraction, drying and packaging; tuber indexing, packaging and greensprouting; and herbarium specimen drying and mounting.

An aluminum frame, plastic-covered greenhouse, providing approximately 2000 square feet of planting space, is near completion and will be available for use in early spring, 1967. Heat can be supplied as necessary in early spring to provide additional greenhouse space for seed increase and again in late fall for tuber increase of introductions with intermediate photoperiod requirements.

Shipments of seeds and tubers were made to 20 states and 16 countries. Shipments included 1267 seed and 455 tuber samples of species introductions, and 59 seed and 479 tuber samples of germ-plasm involving introductions developed by the cooperative USDA-Wisconsin Genetics and Cytogenetics Project.

A supplement to the 1965 "Inventory of tuber-bearing Solanum species," listing the interspecific hybrids and the introduced advanced selections and varieties available, was completed in 1966. More than 450 copies have been distributed to researchers and libraries throughout the world. This mailing has prompted more than 50 additional requests for copies of the 1965 "Inventory" by potato workers who had not received one earlier.

Basic research programs being conducted in several states are providing more information concerning the potential value of the Solanum species. Twelve papers, 8 abstracts, and 6 theses reporting the use of Solanum introductions appeared in 1966. These included reports of resistance to aphids, bacterial wilt, and frost as well as basic genetic and cytogenetic investigations. These investigations will provide the knowledge needed for more effective use of the diversity in the Solanum species.

EASTERN REGIONAL POTATO TRIALS^{1/}
R. V. Akeley, F. L. Haynes
M. E. Gallegly and R. L. Plaisted

In 1966 potato breeders in eastern areas of the United States continued their cooperative yield trials in four states: Maine, West Virginia, North Carolina and New York.

Planting procedures for each state were as follows:

State	Date Planted	Date Harvested	Row Spacing	Seed Spacing	Fertilizer Per Acre
Maine	May 13	September 16	34 in.	10 in.	1200 lbs. (10-15-15)
North Carolina	April 15	August 24	42 in.	10 in.	1500 lbs. (5-10-10)
New York	-	-	36 in.	10 in.	-
West Virginia	May 5	September 28	38 in.	10 in.	800 lbs. (10-20-20)

Four replications of 25-hill plots were used in Maine, West Virginia, and North Carolina, and three replications of 25-hill plots were used in New York. The randomized, complete block design was used in each of the states.

The 1966 trial results are presented in Northeastern tables 1 and 2.

Northeastern table 1. Yield of U.S. No. 1 tubers per acre in four states, 1966.

Variety or Selection	Locations									
	Maine		West Virginia		North Carolina		New York		Mean	
	Cwt.	Pct.	Cwt.	Pct.	Cwt.	Pct.	Cwt.	Pct.	Cwt.	Pct.
Katahdin	394	97	294	68	228	87	363	82	320	83
Kennebec	458	98	178	37	247	75	462	89	336	75
Cobbler	411	95	209	52	231	86	327	80	294	78
B4829-7	472	98	157	73	213	84	187	55	257	77
B5000-18	358	93	90	58	258	84	288	84	248	80
B5036-40	451	96	192	52	205	88	381	81	307	79
B5052-7	390	97	317	79	276	81	320	84	326	85
B5066-3	439	96	248	69	273	79	417	84	344	82
B5088-7	409	97	232	79	438	85	299	77	344	84
B5141-6	305	91	226	69	315	93	321	82	292	84
B5090-11	410	95	216	52	252	75	300	72	294	73
B5132-3	466	95	244	73	291	83	358	82	340	83
LSD .05	75		113		63		95			

^{1/} For Pennsylvania see page 193.

Northeastern table 2. Specific gravity, maturity class, and tuber appearance rating in three states, 1966.

Variety or Selection	1/ Specific Gravity			2/ Maturity Class			3/ Tuber Appearance		
	Maine		Mean	Maine		Mean	Maine		Mean
	W.Va.	N.C.		W.Va.	N.C.		W.Va.	N.C.	
Katahdin	93	63	78	5	3	4	3	4	4.0
Kennebec	90	69	79	5	4	4	3	3	3.3
Cobbler	95	59	77	2	2	1	2	3	3.3
B4829-7	85	60	72	2	1	2	3	5	4.0
B5000-18	86	65	75	3	2	1	3	3	3.7
B5036-40	95	63	79	5	3	1	3	3	3.3
B5052-7	85	62	73	5	5	1	5	5	5.0
B5066-3	93	63	78	2	2	2	3	5	4.0
B5088-7	82	73	77	3	2	4	4	5	4.0
B5141-6	108	93	100	4	3	2	3	4	4.0
B5090-11	84	61	72	3	1	4	4	3	3.3
B5132-3	85	59	72	3	2	2	3	4	4.0

1/ 1.0 omitted from specific gravity values.

2/ Maturity: 1 = early, 2 = medium-early, 3 = midseason, 4 = medium-late, and 5 = late.

3/ Tuber appearance: 1 = poor to 5 = excellent.

NORTH CENTRAL REGIONAL TRIALS
R. H. Johansen and cooperators^{1/}

The North Central Regional Potato trials were first established in 1950. This year with twelve states participating was the sixteenth year that the trials have been conducted.

The North Central trials have been beneficial in testing and evaluating advanced selections over a wide range of environmental conditions. The importance of such trials are quite evident by the number of advanced numbered selections that have been tested in the trial prior to their introduction and are now named varieties of economical importance. Since the North Central trials were first established ten of the first twenty-five varieties presently leading in United States certified seed production have been tested as a numbered selection in the North Central trials.

During the past season Norgold Russet ranked fourth, Norland eighth and Superior tenth. Other varieties presently ranked in the first twenty-five are: LaRouge, Haig, Early Gem, Cherokee, Onaway, Viking and Bounty.

Recent variety introductions that have been tested in the North Central trials:

<u>Progeny No.</u>	<u>Year Released</u>	<u>Released Name</u>	<u>Introduced By</u>	<u>Parents</u>
I 57410	1966	Chieftan	Iowa	Lal354xLal017-18

Environmental Conditions: These tests were conducted on peat soils in Indiana. Mineral soils at other locations ranged from clay loam to loamy, very fine sand. The Louisiana trial was grown on alluvial, Mississippi river bottom soil. Cultural practices (fertilizer application, irrigation, spray program, vine killing, planting distance) are based on local conditions.

Planting and harvest dates are listed below:

<u>State</u>	<u>Date Planted</u>	<u>Date Harvested</u>	<u>Total Days to Harvest</u>
Indiana	April 5	July 21	108
Iowa	April 12	July 25	105
Kansas	No date reported	August 3	105
Louisiana	March 8	June 7	91
Michigan	May 19	October 13	148
Minnesota	May 25	October 13	142
Missouri	March 17	August 24	161
Nebraska	June 12	October 4	115
North Dakota	May 19	September 16	121
Ohio	June 17	October 21	127
South Dakota	No data reported		
Wisconsin	April 26	September 27	155

^{1/} Indiana, H. Erickson; Iowa, J. Weigle; Kansas, J. Greig; Louisiana, J. Fontenot; Michigan, N. Thompson; Minnesota, O. Turnquist; Missouri, V. Lambeth; Nebraska, R. O'Keefe; North Dakota, R. Johansen; Ohio, W. Brown; South Dakota, C. M. Nagel; Wisconsin, J. Schoenneman, D. Kichefski, S. Peloquin; USDA, R. Akeley, T. Dykstra.

Rainfall and temperature was again quite variable during the 1966 season. In Louisiana, planting was delayed until March because of excessive rainfall and generally poor growing conditions followed throughout the season.

Missouri had unseasonably low temperatures at planting time and high temperatures during June. Rainfall was below normal and temperatures above normal in Indiana, Iowa, Michigan, Minnesota, Nebraska and Ohio. Temperatures were above normal and rainfall moderate in North Dakota, Missouri, Wisconsin and Kansas. For most states temperatures in July were generally much above normal while August and September were quite cool. It was necessary to irrigate in Indiana, Iowa, Kansas, Michigan, Nebraska and Wisconsin. Iowa reported an early spring frost shortly after plant emergence. A killing frost occurred early in Nebraska.

Entries: Entries for the 1966 trial were received from Wisconsin, Louisiana, North Dakota, Nebraska, USDA Maine, and USDA Louisiana. North Dakota furnished seed of the check varieties Norland, Red Pontiac and Cobbler. La 11-150, not listed as an original entry from Louisiana was not tested in Iowa, Louisiana and Wisconsin. Seed of TL 8197 was not available for the trials in Indiana, Michigan, Minnesota and Ohio.

Yield: Total and U.S. No. 1 yields are reported in North Central tables 1 and 2. Because of the low U.S. No. 1 yield reported by certain states a table showing total yield is included in the 1966 report.

Yield: U.S. No. 1 (early group). In the early group, Norland and Cobbler produced the highest yield. La 21-111 produced yields averaging approximately 50 cwt. less than the check varieties.

Yield: U.S. No. 1 (late group). For the first time in several years an advanced selection exceeded the average yield of Red Pontiac. Neb. 202.57-1 produced yields averaging 24 cwt. more than Red Pontiac. Other high yielding selections were ND5899-1, Neb 16.55-1 and ND5778-2R. TL8197 and La21-26 produced the lowest yields.

Maturity: All states, except Minnesota and Nebraska, reported maturity readings. No entry was earlier than the check variety Norland, and all entries, except La22-112, were earlier than the check variety Red Pontiac.

Total Solids: Neb 156.51-2, Wisc 560 and ND5899-1 produced the highest total solids. These three selections and Neb 202.57-1 all exceeded the check variety Irish Cobbler. All selections, except TL8117, exceeded the average percent total solids of Red Pontiac.

Scab Reaction: Michigan and Missouri reported no scab. Nebraska reported the highest incident of scab. Few selections had more scab resistance than Norland.

Internal and External Defects: Selections with possible weaknesses are starred only to call it to attention of the person responsible for the selection. Some of these weaknesses are more or less associated with the growing conditions found under the wide environmental conditions. For the second year a high percentage of hollow heart was found in the selection TL8134.

Overall Merit Ratings: Merit ratings are presented for the 1964, 1965 and 1966 seasons for possible comparisons. For 1966 Norland (check variety) was the leading entry in the overall merit rating.

	<u>Rating</u>	<u>1966</u>	<u>1965</u>	<u>1964</u>
1.	Norland	25	9	5
2.	Neb 202.57-1	23	25	*
3.	ND5778-2R	21	40	*
4.	La11-150	18	*	*
5.	ND5899-1	13	10	*

[illegible]

North Central table 2. U.S. No. 1 yield.

Variety	<u>1/</u>			<u>2/</u>			S.D.	Ohio	N.D.	Mo.	Nebr.	Wisc.	Ave.	Yield
	Ind.	Iowa	Kans.	La.	Mich.	Minn.								
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Rank
<u>Early to Med. Early</u>														
W 560	214	177	89	76	261	414		76	118	121	2	495	186	12
La 21-111	250	237	160	43	190	364		109	80	128	21	335	174	15
Norland	264	281	171	83	280	441		156	154	163	79	451	229	6
Cobbler	293	209	199	57	202	387		157	204	197	22	406	212	7
<u>Medium to Late</u>														
La 21-26	171	131	140	7	192	346		85	82	91	12	428	153	18
La 22-112	235	146	80	24	210	390		88	99	93	81	541	181	14
B5036-40	222	212	191	40	225	270		114	111	124	54	517	189	11
B5282-13	248	193	168	35	200	324		128	157	117	7	437	183	13
TL 8117	225	106	153	34	236	272		117	152	96	10	377	162	17
TL 8134	251	110	144	35	189	336		134	110	92	6	431	167	16
TL 8197		164	146	24					93	123	5	304	123	19
ND 4524-4R	166	266	172	42	280	370		153	157	143	12	459	202	9
ND 5778-2R	298	200	152	48	354	463		119	150	186	37	548	232	5
ND 5899-1	280	220	180	53	265	518		168	174	214	37	570	244	3
Neb 156.51-2	224	198	135	34	246	433		139	185	152	61	386	199	10
Neb 16.55-1	286	194	149	79	180	551		192	178	138	130	568	240	4
Neb 202.57-1	314	272	208	35	361	471		204	182	187	170	681	280	1
Red Pontiac	285	177	192	48	388	463		194	220	157	25	665	256	2
La 11-150	333		186		228	337		120	162	206	84		207	8

1/ Total yield. No. U.S. No. 1 yield reported from Indiana.2/ Average 11 locations.

North Central table 4. Total solids.

Variety	1/												
	Ind. Pct.	Iowa. Pct.	Kans. Pct.	La. Pct.	Mich. Pct.	Minn. Pct.	Mo. Pct.	Neb. Pct.	N.D. Pct.	Ohio Pct.	S.D. Pct.	Wisc. Pct.	Ave. Pct.
<u>Early to Medium</u>													
W 560	19.2	16.5	18.9	18.0	20.5	19.3	20.3	22.0	21.6	20.4		19.9	19.7
La 21-111	15.0	13.3	15.9	15.0	17.7	15.8	16.9	20.7	18.8	18.3		15.0	16.6
Norland	15.6	12.9	16.4	15.0	15.8	15.5	17.5	19.7	18.6	18.3		15.6	16.4
Cobbler	17.1	15.0	18.1	15.0	18.0	17.9	19.4	21.2	20.5	20.4		18.6	18.3
<u>Medium to Late</u>													
La 21-26	17.7	16.1	18.5	15.0	18.8	17.9	17.3	21.2	19.0	19.4		18.8	18.2
La 22-112	15.0	13.3	13.1	15.0	17.7	17.2	14.8	21.2	18.2	17.7		19.0	16.6
B5036-40	16.5	13.9	17.2	15.0	19.0	17.7	17.1	22.2	18.6	18.5		16.0	17.4
B5282-13	17.5	14.4	17.4	16.5	17.1	18.3	18.0	20.7	21.4	19.4		17.5	18.0
TL 8117	14.3	12.7	13.4	15.0	16.5	15.5	15.8	18.2	16.9	17.1		14.3	15.4
TL 8134	15.2	13.1	15.7	15.0	17.1	16.4	15.6	19.4	17.5	17.9		17.1	16.4
TL 8197		13.1	16.3	15.0			16.5	21.4	19.0			17.3	16.9
ND 4524-4R	16.7	14.2	15.9	15.0	17.3	16.4	16.5	19.2	19.2	18.8		15.6	16.8
ND 5778-2R	17.3	15.2	17.9	15.6	18.6	17.4	19.2	20.3	19.4	19.0		18.6	18.0
ND 5899-1	19.7	16.5	18.7	17.1	19.2	18.5	18.8	21.4	20.3	19.4		20.5	19.1
Neb 156.51-2	20.1	18.4	22.2	17.1	20.1	20.2	21.4	21.4	22.2	22.4		20.7	20.6
Neb 16.55-1	17.1	15.7	16.1	15.0	17.5	16.8	19.0	21.4	19.4	18.5		18.6	17.7
Neb 202.57-1	19.0	16.5	17.6	16.7	19.4	17.7	19.7	20.9	20.1	20.6		18.8	18.8
Red Pontiac	15.2	13.3	14.6	14.8	16.5	15.8	15.6	19.0	18.6	17.1		15.8	16.0
La 11-150	16.0		16.4		16.5	16.0	17.1	20.9	18.6	18.1			17.5
Average	16.9	14.7	16.9	15.6	18.0	17.2	17.7	20.7	19.4	19.0		17.7	
1/ No date received.													

1/ No date received.

North Central table 5. Scab reactions reported ^{1/}

Variety	Ind.	Iowa.	Kans.	La.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wisc.
<u>Early to Med. Early</u>												
W 560	1-2	T-1	1-1	1-1		3-2		2-3	1-2	T-2		1-3
La 21-111	3-2	T-1	1-2	0-0		2-4		3-5	1-1	T-2		1-5
Norland	2-1	T-1	1-1	1-1		2-3		1-4	T-1	T-1		1-2
Cobbler	2-3	T-1	1-4	1-1		3-5		3-5	1-2	T-1		1-5
<u>Medium to Late</u>												
La 21-26	3-2	1-1	1-3	0-0		1-2		2-4	1-1	T-3		1-4
La 22-112	3-2	T-1	1-2	0-0		1-2		1-4	T-1	T-1		
B5036-40	1-2	1-1	3-4	0-0		1-2		2-2	1-1	T-1		
B5282-13	1-2	T-1	1-3	0-0		2-2		2-4	2-3	T-2		
TL 8117	1-2		1-1	0-0		2-2		2-3	1-1	T-1		1-2
TL 8134	2-3		1-2	1-1		1-3		2-5	1-1	T-2		
TL 8197		T-1	1-1	1-1				2-4	1-1			
ND 4524-4R	3-2		1-1	0-0		1-3		2-5	1-1	T-1		1-4
ND 5778-2R	2-3		1-2	0-0		1-3		1-4	1-1	T-1		1-4
ND 5899-1	3-2	T-1	1-2	0-0		2-3		2-5	1-2	T-1		
Neb 156.51-2	2-1	T-1	1-1	1-1		2-5		2-5	T-1	T-1		1-5
Neb 16.55-1	2-1	T-1	1-1	0-0		2-2		1-2	1-2	T-2		1-3
Neb 202.57-1	1-4	T-1	1-1	1-1		1-2		1-3	1-2	T-4		
Red Pontiac	3-2	1-1	1-5	0-0		2-4		2-5	1-1	T-2		1-5
La 11-150	1-3		1-1			1-2		1-3	1-1	T-1		

1/

Area
Type
T = less than 1%
1 = small, superficial
2 = larger, superficial
3 = large, rough pustules
4 = large pustules, shallow holes
5 = large pustules, deep holes

2/ No data received.

North Central table 6. Summary of grade defects.

Variety	External			1/ Total			Internal			1/ Total	
	Scab Pct.	Growth Cracks Pct.	Second Growth Pct.	Sun Green Pct.	Free of Ext.Def. Pct.	Hollow Heart Pct.	Internal Necrosis Pct.	Vascular dis- coloration Pct.	Free of Int.Def. Pct.		
<u>Early-Medium Early</u>											
W 560	30.5	3.6	2.6	3.4	63.8	8.8	2.7	6.3	82.2		
La 21-111	26.0	2.8	3.2	4.7	65.8	6.5	.5	9.0	84.2		
Norland	29.4	3.4	4.3	1.2	64.5	2.4	2.5	15.5	79.9		
Cobbler	32.9	2.0	10.7	5.2	53.8	9.4	3.8	14.8	73.7		
<u>Medium to Late</u>											
La 21-26	24.8	1.6	5.2	8.5	63.4	3.6	4.9	9.0	83.0		
La 22-112	21.4	2.2	8.1	3.1	67.6	3.8	1.3	7.5	87.9		
B5036-40	21.5	1.2	5.4	8.4	67.7	5.0	.7	15.9*	79.2		
B5282-13	31.7*	3.9	7.2	6.7	55.0	.8	3.7	16.3*	80.0		
TL 8117	20.3	5.4	22.2*	10.6*	48.3	.1	1.7	10.3	88.0		
TL 8134	25.2	4.7	6.7	2.2	65.4	16.2*	4.8	12.3	68.8		
TL 8197	12.3	.3	2.7	.3	84.6	1.9	1.5	8.3	87.6		
ND 4524-4R	23.3	2.1	5.5	1.3	69.5	1.1	2.3	7.5	89.3		
ND 5778-2R	24.4	.8	12.7	3.3	62.1	2.8	6.6	6.2	84.4		
ND 5899-1	28.2	10.1*	6.5	9.1	56.9	3.1	.5	9.6	87.3		
Neb 156.51-2	21.5	1.2	9.9	7.9	57.1	7.1	3.5	11.6	77.9		
Neb 16.55-1	24.0	.3	6.4	5.8	67.3	1.5	3.7	10.3	85.0		
Neb 202.57-1	21.7	3.2	3.0	4.0	68.5	5.3	3.2	7.1	85.9		
Red Pontiac	33.5	3.2	9.6	2.5	57.0	6.0	3.2	13.2	78.1		
La 11-150	18.0	.1	6.1	10.6	70.1	.5	12.1*	17.9*	69.9		

1/ Percent normal tubers showing no defects (some individual tubers had more than one type of defect).

* Possible weakness of variety.

North Central table 7. Merit rating^{1/}

Variety	Ind.	Iowa	Kans.	La.	Mich.	Minn.	Mo.	Neb.	N.D.	Ohio	S.D.	Wisc.	Points Total
<u>Early-Medium Early</u>													
W 560	2			5	4								11
La 21-111		4								3			7
Norland		5		4	5	4		1	1	5			25
Cobbler													0
<u>Medium to Late</u>													
La 21-26					3								3
La 22-112								4				5	9
B5036-40								2					2
B5282-13	1		4			1			2				8
TL 8117													0
TL 8134						2				1			3
TL 8197		2											2
ND 4524-4R					1							2	3
ND 5778-2R	4	3		2		3	3		5			1	21
ND 5899-1		1	3	1			5		3				13
Neb 156.51-2			1				1						2
Neb 16.55-1				3				3		2		3	11
Neb 202.57-1	3		5		2		4	5				4	23
Red Pontiac									4				4
La 11-150	5		2			5	2			4			18
<u>1/ Merit points determined as follows:</u>													
					Merit Rating			Merit Points					
					1			5					
					2			4					
					3			3					
					4			2					
					5			1					

NORTH CENTRAL 84 PROJECT

R. H. Johansen and Cooperators Having Contributing Projects^{1/}

The NC 84 Project, Potato Genetics, was organized as a regional project in 1965. During 1966, Michigan, Minnesota, Wisconsin, and Nebraska, had contributing project to NC 84.

The objectives and a brief summary of the project activities for 1966 are as follows:

- a. To investigate potato genetics at the diploid level. Studies were continued on the inheritance of several plant and tuber characteristics. To accomplish this, crosses at the diploid level were made between clones differing in adventitious bud producing capability, yield, specific gravity, and other tuber and plant characteristics. Other investigations of potato genetics at the diploid level concerned the study of self and cross incompatibility, evaluating the effects of inbreeding, and the development of highly inbred lines. Hybrids between diploid tuber-bearing solanum species and tuberosum haploids were used as the genetic base for the studies on the effects of inbreeding. Several of these F₁ self compatible clones were vegetatively doubled and used to study inbreeding depression in equivalent diploid and tetraploid families.
- b. To determine the relation between gametic and zygotic genetic variation. Studies were continued in Nebraska, Minnesota and Wisconsin in evaluating clones representing haploids (2N gametes) and their related tetraploid (4N zygotes). Several hundred clones were evaluated for 19 vine, floral, and tuber genetic characters. Studies showed that with most genetic characters the 4N clones were correlated with their counterparts of the 2N clones. Complete analysis of the gamete-zygote data should provide information relative to the genotypic, gene dosage, and environmental effects associated with the inheritance of each character. Other studies included the investigation of the performance of phureja-haploid tuberosum hybrid clones and their vegetatively doubled counterparts. The diploid clones were taller and had more stems four weeks after planting than the tetraploids clones. The number of stems was positively correlated with yield for the tetraploids but not for the diploids. Crosses have been made to develop appropriate materials needed to evaluate the factors involved in vegetative vigor.
- c. To develop methods to exploit the vast genetic variability present in wild and cultivated tuber bearing Solanum species. High yielding, fertile, 24-chromosome tuberosum clones are being crossed with species having desirable characters. Progeny selection is done at the diploid level. Also 24-chromosome clones are being crossed directly to highly adapted 48-chromosome cultivars.
- d. To develop procedures and stocks basic to investigating gene-chromosome relationships. Preliminary crosses made between triploid (2N=36) and diploids (2N=24) Solanums produced nine trisomic plants (2N=25). Progeny from further 3x-2x mating produced twenty aneuploids in which twelve were classified as trisomics. Initial studies on the morphology, fertility, and chromosome behavior of the trisomic plants has been started. Evidence indicates that trisomics can be produced with reasonable frequency, and that they probably will be fertile enough to be used in genetic studies.

^{1/} Indiana, H. Erickson; Michigan, N. Thompson; Minnesota, F. Lauer; Nebraska, R. O'Keefe; Wisconsin, S. Peloquin and R. W. Rowe.

PACIFIC NORTHWEST
Aberdeen, Idaho
J. J. Pavek

The principle objective of the cooperative USDA--University of Idaho potato breeding program is the incorporation of disease resistance in a high yielding, long russet. Verticillium wilt, common scab, early blight, and leafroll are the important diseases; although recently little leafroll has occurred in Idaho, it continues to be important in the Columbia basin. Eumartii wilt has occurred sporadically.

Fifty-two clones, superior in one or more characteristics, were crossed in 145 combinations in the greenhouse during April. The "decapitation" technique greatly facilitated hybrid seed production on clones which tended to drop their flowers or fruits prematurely; 11 crosses with Russet Burbank produced approximately 3300 plump seeds. A number of other treatments^{a/} of Russet Burbank were relatively unsatisfactory.

Approximately 20,000 seedlings were grown from true seed in the greenhouse; these will be grown in single hills at the Tetonia Experiment Station in 1967. Of the 25,000 single hills at Tetonia in 1966, 587 were selected to be grown in 5-hill plots at Aberdeen next season. Sixty-two of the 332 clones in 5-hill plots in 1966 were selected for further testing.

Advance selections were grown in two yield trials at Aberdeen. Soil type was Declo sandy loam and was fertilized with 150 pounds each of N and P₂O₅ per acre; straw from the previous year's grain crop had been plowed under. The trials were planted on May 9 and 11. Hills were spaced 11 inches apart in 36-inch rows. The field was surface irrigated. A frost on June 25 killed back the vines about 50%; the first killing frost in the fall did not occur until September 30. Both trials were harvested on October 3. Despite the June frost, yields and tuber size were good, probably because the maximum daily temperature averaged 4.7° above that of the previous four years.

Aberdeen Yield Trial. Twenty selections and six check varieties were grown in 20-hill plots replicated four times in an RCB design. Yields, specific gravities, verticillium wilt and scab reactions, french fry color, and tuber descriptions are presented in Idaho table 1. Only Shoshoni yielded significantly more ($P=0.05$) than Russet Burbank, and six entries less. Nine of the entries exceed Russet Burbank in specific gravity, nineteen had less verticillium wilt.

Aberdeen Duplicate Yield Trial. Seventy-seven selections and three check varieties were grown in 10-hill plots replicated twice; 39 of the selections were from the 1965 five-hill plots. The data are presented in Idaho table 2. Thirteen of the entries yielded significantly more than Russet Burbank; only one of these, A59325-2, was also significantly higher in solids. Nineteen of the selections had significantly less verticillium wilt. It is of interest that a number of the top yielding selections are related to Shoshoni.

^{a/} (1) Girdling with copper wire, (2) 2,4-D treatment of abscission layer, (3) grafting onto tomato, and (4) uniform cool temperature in growth chamber.

Early Blight. One hundred ninety selections and varieties were planted at Aberdeen and in the Dry Lake area of western Idaho to determine the early blight reaction of the foliage. Although sprinkler irrigation and artificial inoculation were used, very little blight developed at Aberdeen; the exceptionally small vines which resulted because of the June frost, and the very low humidities probably did not provide a favorable environment. The blight at Dry Lake was uniformly heavy. A partial listing of the entries, their reactions, and apparent maturities at Dry Lake are presented in Idaho table 3. On the whole, the later maturing clones had the least blight. Certain of the entries, e.g., Wash. 168-3, appeared to be tolerant of the infection, and certain others, such as Green Mountain, appeared to be hypersensitive. On August 30, using a scale of 1 (least) to 5 (most severe), 14 entries were placed in reaction class 1, 35 in class 2, 51 in class 3, 51 in class 4, 26 in class 5, and 13 were dead.

Net Necrosis. One plant per plot in each of three replicates of the early blight planting at Aberdeen was inoculated with leafroll by clipping small cages containing viruliferous aphids to individual leaflets. The tubers will be evaluated for net necrosis during the later part of January, 1967.

Common Scab. Scab is a serious problem on some of the newly irrigated desert soils of Idaho. On some of these soils it is impossible to produce marketable Russet Burbanks. Three hundred twenty-four selections and varieties were planted in one of the fields which had been taken out of potato production. The reactions of 48 of the entries are presented in Idaho table 4; most of the other entries were highly susceptible.

Distribution. During 1966 tubers of Aberdeen selections were distributed to researchers in Arizona (Bessey), California (Corrin), Montana (Metcalf), North Dakota (Picha), Washington (Hoyman, Kunkel, McMillan), Australia (Sparks), Canada (Hargraves, Menzies), and Idaho (Iritani, Groskopp, and Robertson).

Wisconsin 2X - 4X Families. Ten families of diploid clones and their autotetraploid counterparts were grown in two replications at Aberdeen in cooperation with Dr. P. R. Rowe. Data on heights, leaf lengths, and tuber numbers and weights were collected and turned over to Dr. Rowe.

Idaho table 1. Aberdeen yield trial, 1966 (4 replications of 20 hills).

Clone	Yield Per Acre				Specific Gravity ^{1/}	Vert. Wilt ^{2/} (9-9-66)	Area Type	French Fry Color ^{4/}		Tuber Type
	Total		No. 1 Small							
	Cwt.	Pct.	Pct.	Pct.						
Shoshoni	253	71	9	17	85	2.8	0	2.3		Round to oblong, russet
A6126-4	230	69	15	11	93	1.0	1 - 4	3.1		Round russet
A6135-4	229	81	6	11	95	1.3	T - 2	1.9		Oblong-long, lt. net
A6176-7	214	77	2	20	88	2.0	0	1.5		Round to oblong russet
A610-19	200	53	9	39	89	2.8	0	1.2		Long russet
A6104-2	200	83	5	8	88	4.1	1 - 3	2.3±		Round, flaky net
A477-8	198	65	17	26	87	4.4	0	1.4		Long russet
A492-2	196	64	23	19	104	1.6	0	2.3		Long-oblong russet
Kennebec	196	76	13	10	86	4.4	1 - 4	1.7		Round to oblong, white
Menominee	195	82	8	9	95	1.5	0	1.9		Round, flaky net
A374-3	195	68	15	15	91	1.9	0	1.8		Round to oblong russet
F162-1A	194	78	13	8	86	3.9	1 - 4	2.0		Oblong russet
Russet Burbank	193	73	18	8	87	4.6	0	1.5		Long russet
A496-4	189	80	11	8	101	1.3	1 - 4	1.5		Round, flaky net
A595-15	186	45	11	42	82	4.8	0	1.8		Oblong-long russet
A60120-1	179	73	21	5	85	3.4	1 - 4	1.5		Round, lt. flaky net
A6176-16	178	70	15	13	76	4.4	0	3.1		Oblong to long russet
A6085-5	177	59	10	30	90	3.6	0	2.5±		Round to oblong russet
A463-4	177	74	13	15	86	2.8	0	2.5±		Oblong-long russet
A6153-11	165	68	12	19	89	4.5	0	1.7		" "
Norgold Russet	151	62	35	1	81	4.3	0	3.0		Long-oblong russet
A6182-5	145	83	10	6	93	1.4	T - 2	2.9		Oblong, lt. flaky net
Early Gem	130	61	12	26	72	4.2	0	2.7		Oblong-long russet
A6153-7	122	66	17	16	93	1.2	0	2.0		Round russet
A6059-10	115	65	32	5	86	4.4	0	2.8		Oblong russet
B2759-10	110	76	21	2	95	3.9	1 - 4	2.0		Round, flaky net
Mean	182	70	14	15	88	3.0		2.1		
LSD .05	41				3	0.2				
LSD .01	54				4	0.3				

1/ 1.0 omitted. 2/ Amount of wilt, rated 1 (slight) to 5 (severe). 3/ Area covered: T, less than 1%; 1, 1-20%; Type: 1, small surface lesion, to 3, large surface lesion; 4, small pit, and 5, large pit.
 4/ Mean of 2 reps, stored at 50°F; USDA Color Standards for Frozen French Fried Potatoes; rated 1 (light) to 5 (dark), ± indicates color variation within the tubers fried.

Idaho table 2. Aberdeen duplicate yield trial, 1966 (2 replications of 10 hills).

Clone	Yield Per Acre				Specific Gravity ¹	Vert. Wilt ² / (9-10-66)	Scab ³ / Area Type	French Fry		Tuber Type
	Total		No. 1 Small					Color ⁴		
	Cwt.	Pct.	Pct.	Pct.						
A6201-3	341	65	17	16	76	2.7	0	2.0		Oblong-long russet
A6063-2	335	69	13	17	90	1.9	1 - 3	2.0		" "
Shoshoni	334	67	6	22	77	2.4	0	2.5		Round to oblong russet
A6201-6	331	71	2	30	80	1.2	0	2.0		Oblong-long russet
A6203-4	323	71	14	13	84	1.2	0	2.5		Oblong russet
A6207-3	299	85	5	8	78	1.0	1 - 2	2.0		Oblong, coarse net
A59325-2	297	66	16	16	96	1.5	T - 1	2.0		Oblong-long russet
A6176-10	292	78	9	12	84	3.0	T - 1	2.6 ⁺		Long-oblong, lt. flaky net
A6201-1	287	33	12	24	74	2.8	0	2.0		Oblong-long russet
A6356-6	281	68	14	17	79	4.3	T - 2	2.7		Long russet
A6305-3	278	69	18	12	89	1.9	0	2.0 ⁺		Oblong-long russet
A6056-1	277	69	11	19	90	1.0	0	2.2		Oblong russet
A180-26	276	63	16	13	87	1.5	0	2.0		" "
A6356-8	267	67	8	24	91	2.2	0	2.0		Long russet
A6104-4	265	59	22	20	86	4.6	1 - 2	2.6		Oblong, flaky net
B6101-2A	263	67	10	22	79	2.0	1 - 5	3.0		Long-oblong white
A59160-4	257	90	3	5	85	3.4	1 - 3	2.5		Round, lt. flaky net
A59216-4	248	71	16	11	85	2.9	0	1.8		Long-oblong russet
A6356-7	247	56	22	38	73	4.4	0	1.9		" "
A6258-1	246	67	17	14	93	2.0	1 - 4	2.2		Oblong, flaky net
A6201-5	241	36	16	46	82	0.8	0	2.7		Round-oblong russet
A503-42	237	60	17	22	92	2.3	1 - 5	1.9		Round, lt. flaky net
A62148-5	235	87	7	4	85	1.5	1 - 3	2.2		Oblong, lt. flaky net
A60146-1	234	68	16	15	87	1.2	T - 3	2.1		Round-oblong, white
A6176-17	231	65	21	19	80	2.5	0	2.0		Oblong-long russet
A6102-2	230	69	13	16	81	3.3	0	2.5		Oblong russet
A62180-2	228	77	15	7	93	0	0	1.0		Round-oblong russet
A63184-1	225	46	10	43	77	1.5	0	3.8		Oblong russet
A6201-7	224	70	4	24	75	2.0	0	2.0		Oblong-long russet
A62155-6	221	63	9	26	92	1.5	0	2.0		Oblong russet

continued

Table 2, continued.

A6176-6	220	41	23	35	85	3.4	0	1.8	Long russet
Russet Burbank	219	67	17	14	87	3.1	T - 1	1.5	" "
A6153-2	218	34	15	50	79	3.6	0	1.7	Round-oblong russet
A6077-1	214	55	28	15	77	2.0	1 - 1	2.2	Long russet
A5943-3	214	88	6	4	81	4.8	T - 1	2.0	Round russet
A63184-6	213	81	10	8	80	3.7	1 - 5	2.1	Oblong-long russet
A6356-9	212	65	21	12	76	2.7	0	2.5	Long russet
A6153-12	212	32	12	55	91	2.0	0	1.0	" "
A6108-1	211	80	11	8	82	4.9	1 - 2	3.0	Oblong russet
A62155-8	209	76	16	3	93	2.6	T - 3	1.9+	" "
A6153-10	206	60	29	9	87	4.7	0	1.8	Round russet
Norgold Russet	206	56	27	15	80	4.9	0	3.0	Long-oblong russet
A535-9	204	54	28	16	99	3.4	0	1.0	Oblong-long russet
A6102-3	204	70	11	18	80	1.6	1 - 2	2.5	" ", lt. net
A5943-1	203	68	19	12	83	4.7	T - 3	2.2	Long russet
A60158-1	202	69	21	8	91	3.4	1 - 3	1.8	Oblong, lt. net
A576-2	201	53	24	22	90	1.3	1 - 4	-	Oblong, white
A6356-2	200	68	17	14	88	2.6	0	2.4	Long russet
A469-4	198	52	8	39	88	1.2	T - 3	2.0	Round russet
A59225-2	198	79	15	5	74	2.6	0	0.8	Long-oblong russet
A63184-3	198	76	13	10	92	4.5	1 - 3	1.9	Oblong russet
A575-7	198	49	19	31	92	2.9	0	1.5	Round russet
A59197-5	198	57	40	1	88	2.7	T - 1	2.0	Oblong russet
A60215-1	198	51	14	33	83	4.3	1 - 3	2.0	Long russet
A594-11	196	51	41	6	97	3.5	0	1.0	Oblong-long russet
A6177-2	195	52	15	31	82	3.7	0	1.6	Long russet
A5981-2	193	58	17	24	82	3.5	T - 2	1.9	" "
98-22	191	66	23	10	80	4.7	0	2.2	Oblong russet
A62180-1	190	76	11	14	86	3.2	T - 1	0.9	" "
A6202-3	188	66	25	5	83	3.7	T - 1	2.2	" "

continued

Table 2, continued.

A62171-1	188	75	6	18	84	3.1	1 - 1	2.5	Long-oblong, white
A6356-5	186	63	13	22	67	4.7	0	1.5	" russet
B5010-3A	181	51	31	16	93	3.9	0	2.5	Oblong-long russet
A466-2	184	70	13	15	93	1.0	1 - 2	1.2	Round russet
A6207-9	180	19	19	60	80	2.2	0	2.0†	Oblong-long russet
A62155-4	180	70	17	11	102	0.9	0	2.0†	Oval russet
A6206-4	176	51	16	32	91	1.0	1 - 2	2.3	Oblong, white
A62148-4	170	70	15	13	97	2.5	0	1.2	Oblong russet
A62155-10	169	67	14	17	90	4.0	0	1.8	"
A60150-1	169	64	21	14	81	4.9	0	1.0	"
A6216-3	169	62	8	28	90	3.0	1 - 2	3.2	Round russet
A6176-5	165	73	7	19	80	2.2	1 - 3	2.1	Oblong, white
A6102-4	164	34	25	40	77	4.7	0	3.2	Oblong-long russet
A6178-1	161	67	11	20	89	1.2	0	2.8†	Long-oblong russet
A6110-6	161	50	9	40	77	2.2	0	3.0†	Oblong russet
A6129-8	159	64	23	12	84	4.9	0	--	Oblong, coarse net
A59197-6	158	69	28	3	96	2.2	1 - 3	1.5	Oblong russet
A62157-3	153	68	17	13	88	3.9	0	1.2	Long-oblong russet
A6258-3	149	62	31	5	90	2.6	0	1.3	Round-oblong russet
A6129-9	148	61	10	28	81	4.7	1 - 5	2.0	Long, lt. flaky net
Mean	219	64	16	19	85	2.8		2.0	
LSD .05	53					1.3			
LSD .01	71					1.8			

1/ 1.0 omitted.

2/ See footnote 2, table 1.

3/ See footnote 3, table 1.

4/ One rep. of 2 tubers, see footnote 4, table 1.

Idaho table 3. Early blight reactions in Dry Lake area, Canyon Co., Idaho.
August 30, 1966. Unreplicated, 3-hill plots, except for Norgold, Penobscot,
and Russet Burbank checks.

Variety	Apparent Maturity ^{1/}	Early Blight (foliage) ^{2/}	Variety	Apparent Maturity ^{1/}	Early Blight (foliage) ^{2/}
Alaska Russet	E	5	A180-26 ^{3/}	M	2
Early Gem	E	3	A378-2	M	2
Haig	E	5	A535-9	M	2
Monona	E	5	A6085-6	M	2
Norgold Russet	E	4	A6102-2	M	2
Platte	E	5	A6119-6	M	1
Tawa	E	4	A6135-4	M	2
Chippewa	M	4	A6153-2	M	2
Green Mountain	M	5	A6153-10	M	1
Hi-Plains	M	5	A6176-5	M	1
Katahdin	M	2	A6176-10	M	2
Kennebec	M	3	A6178-1	M	2
Ona	M	3	A6201-5	M	2
Penobscot	M	3	A6206-4	M	1
Pioneer	M	5	A6207-3	M	2
Reliance	M	4	A62155-4	M	2
Russet Burbank	M	4	A170-9	L	2
Saco	M	4	A380-5	L	2
Shoshoni	M	2	A394-1	L	1
Viking	M	5	A465-11	L	2
Yampa	M	4	A466-2	L	2
Blanca	L	2	A469-4	L	2
Menominee	L	2	A483-17	L	2
Merrimack	L	2	A503-42	L	2
Saranac	L	3	A476-2	L	1
Russet Rural	VL	1	A589-65	L	2
Seneca	VL	2	A59197-6	L	1
			A60120-1	L	1
B2913-24	VL	2	A60154-1	L	2
B3556-12	VL	1	A6153-12	L	2
B6101-2A	M	2	A6203-4	L	2
CS13153	VL	2	A6356-9	L	1
LS205	M	2	A492-2	VL	1
41956	M	4	A59197-5	VL	2
X1276-185	M	2	A6178-6	VL	1
Wash. 12-3	M	4	A62180-2	VL	1
Wash. 168-3	M	3			

^{1/} Apparent maturity of foliage; verticillium wilt and a root rot were also attacking the plants.

^{2/} Amount of blight observed, 1, slight to 5, severe; size and quantity of lesions and reaction of plant to infection considered.

^{3/} Eighty-nine Aberdeen selections not listed had blight ratings of 3, 4, or 5.

Idaho table 4. Scab reactions, Rising River area, Bingham County, Idaho, 1966.
Partial listing of entries. Unreplicated 3-hill plots, except for Russet Burbank, Norgold, and Shoshoni checks.

Variety	Area	Type Lesion ^{1/}	Variety	Area	Type Lesion ^{1/}
	Pct.			Pct.	
Early Gem	T-10 ^{2/}	1-2	A589-43	30	3&4
Kennebec	75+	5	A589-65	T-10	1-2
Menominee	T-10	1-2 ^{3/}	A594-11	T-10	1
Norgold Russet	T-10	1-2	A595-15	T	4
Pioneer	20-30	3&4	A598-101	20	3&4
Platte	10-20	2	A610-19	40	3&4
Reliance	50+	3&4	Wash. 12-3	T-10	1
Russet Burbank	50	3&4	Wash. 168-3	40	1-2
Shoshoni	T-10	1-2			
Viking	10	2-3	Apparently resistant (less than 20% of area with type 1 or 2)		
A180-26	T-10	1-2			
A374-3	T-10	1-2			
A378-2	T-10	1-2			
A380-5	T-10	1-2	A598-2		
A394-1	T-10	1-2	A59197-5		
A463-4	75+	3&4	A59216-4		
A466-2	75+	3&4	A6102-2		
A469-4	75+	3&4	A6176-7		
A477-8	T-10	1-2	A6201-1		
A477-11	50+	3&4	A6201-3		
A483-6	to 30	2-3	A6201-5		
A483-17	to 50	3	A6207-9		
A492-2	T-10	1-2	A6305-5		
A501-13	75+	3&4	A6305-8		
A535-9(v. hvy net)	T	1	A6314-17		
A575-7	20	2	A6365-4		
A576-2	25	1-2			

^{1/} Type: See footnote 3 table 1.

^{2/} T-10 indicates that area covered with lesions was estimated to be between a trace and 10%.

^{3/} Rarely a small pit (type 4) was found.

ALABAMA

Sam T. Jones, Hubert Harris, F. E. Garret, Harold Yates,
S. E. Gessendanner and Marlin Hollingsworth

Gulf Coast Substation, Fairhope, Alabama. Twenty potato varieties and numbered breeding lines were grown and compared in a replicated trial at the Gulf Coast Substation, Fairhope, Alabama, in 1966. In addition 8 numbered lines were grown without replication. The replicated lines and varieties were grown in a randomized complete block design with four replications. Plots consisted of two rows 25 feet long containing 25 hills each. Plots were fertilized with 1200 lbs. per acre of 4-12-12 fertilizer containing 2 per cent Mg O in the row prior to planting. They were sidedressed with 800 lbs. per acre of 8-8-8 four weeks after planting. One and one-half ounce seed pieces were planted February 22. Excessive rains followed planting and stands were poor. However, one of the most interesting results of the test was the reaction of the seed pieces of the different varieties and breeding lines to the adverse conditions. High Plains, Platt, Red LaSoda, LaRouge and ND 6127-10R had a stand of 36 hills out of a possible 50 or better while others had significantly less than the best. Plots were harvested on June 3 after 100 days. The results are given in Alabama table 1.

Sand Mountain Experiment Station, Crossville, Alabama. Fifteen potato varieties and breeding lines were grown in a randomized complete block design with four replications at the Sand Mountain Substation in 1966. In addition 5 lines were grown and not replicated. Plots were single rows 50 feet long containing 50 hills of potatoes. Fertilizer used was the same as for the Gulf Coast Substation. Growing conditions were good, and yields and specific gravities were high. Plots were planted on March 21 and harvested 100 days later on June 30. Yields, chip color, and specific gravity are given in Alabama table 2.

North Alabama Horticultural Substation, Cullman, Alabama. Fifteen potato varieties and numbered breeding lines were planted on March 21, 1966 at the North Alabama Horticultural Substation, Cullman, Alabama, in a randomized complete block design with 4 replications. Plots were single rows 50 feet long containing 50 hills of potatoes. One-thousand pounds per acre of 8-8-8 fertilizer was used in the row prior to planting and the same amount and ratio was used as a sidedress 4 weeks after planting. Yields and specific gravities were high as growing conditions were good. The plots were harvested on June 30, 100 days after planting. Yield, chip color, and specific gravity are given in Alabama table 3.

Alabama table 1. Yield, stand count, specific gravity, and chip color of potato varieties grown at Gulf Coast Substation, Fairhope, Alabama, 1966^{1/}

Variety	Yield Per Acre			Stand Count Ave. ^{3/}	Specific Gravity ^{4/}	Chip Color ^{5/}
	Total ^{2/}	1 7/8" & Up	1 1/2 - 1 7/8"			
	Cwt.	Cwt.	Cwt.			
Red LaSoda	136 a	130	6	42 abc		
LaRouge	107 b	102	4	37 abcd	64	6.6
LaChipper	101 b	96	5	35 bcde	66	6.9
Platt	100 b	88	12	44 ab	72	7.9
I57410-4	100 b	95	5	33 cdef	65	8.1
High Plains	92 bc	72	20	46 a	68	7.4
Keswick	76 cd	73	3	33 cdef	69	9.0
Pungo	75 cd	72	3	29 defgh	76	8.0
ND 6127-10R	75 cd	64	11	36 abcd	72	7.5
Red X	71 cde	70	2	32 cdef	69	7.1
Viking	70 cde	67	3	32 cdefg	68	7.6
Snowflake	63 def	60	3	26 efghi	68	7.6
ND5778-7R	61 defg	55	6	24 fghi	70	8.5
TL7935	60 defg	58	2	21 hi	71	7.5
Superior	55 defg	53	3	26 efghi	64	6.5
Sebago	54 defg	49	5	22 ghi	74	8.4
Fundy	51 defg	48	3	32 cdefg	65	8.5
Ona	48 efg	45	3	20 hi	78	7.1
Norgold Russet	38 fg	32	6	22 ghi	61	6.5
White X	33 g	29	5	18 i	72	5.6
L.S.D. .05	23			9	69	5.5
<u>Not Replicated</u>						
ND4524-4R	87	82	5	21	72	8.0
ND6509-7R	115	106	9	33	74	7.7
ND5886-2	96	90	5	44	71	7.7
ND5899-1	89	83	6	36	70	9.0
TL8134	26	24	1	39	66	6.8
TL8197	21	21	1	14	67	7.8
TL8117	25	24	1	13	-	6.3
ND5922-12	30	28	2	11	-	8.5

^{1/} Potatoes planted February 22, 1966 and harvested June 3.

^{2/} Yields followed by the same letter are not significantly different.

^{3/} Stand counts were exceptionally low due to excessive rains following planting. A perfect stand was 50. Yields were not adjusted for stand counts because ability to establish a stand under adverse conditions appeared to be a varietal characteristic. Stand counts followed by the same letter are not significantly different.

^{4/} 1.0 omitted from all specific gravity readings.

^{5/} Chip color rated from 0 (dark) to 10 (light) with 7 or higher acceptable.

Alabama table 2. Yield, specific gravity, and chip color of different potato varieties grown at the Sand Mountain Experiment Station, Crossville, Alabama, 1966. ^{1/}

Variety	Yield Per Acre				^{2/} Chip Color	^{3/} Specific Gravity
	1 7/8 inches and up	1 7/8-1½ inches	Below 1½ inches	Total		
	Cwt.	Cwt.	Cwt.	Cwt.		
Pungo	203	24	7	235	9.0	82
LaRouge	202	19	7	228	6.8	70
Ona	196	21	8	227	8.0	79
LaChipper	186	20	6	213	8.8	77
Superior	186	22	6	215	8.8	81
Viking	180	26	9	216	7.8	74
White X	179	31	10	220	6.2	78
Fundy	177	32	7	217	8.2	80
Red LaSoda	166	29	9	205	8.0	74
Keswick	163	26	8	198	8.2	82
Red X	161	29	10	202	7.6	75
Sebago	158	29	8	197	8.6	79
Norgold Russet	158	34	12	205	6.2	76
Snowflake	157	33	10	200	8.5	77
I57410-4	144	48	15	208	7.4	74
L.S.D. .05	N.S.					
<u>Not Replicated</u>						
TL 7935	219	17	4	240	7.5	70
La 21-26	63	21	3	88	10.0	88
La 21-112	200	32	8	241	7.0	78
La 22-111	-	-	-	-	9.0	70
LaChipper	191	19	8	219	10.0	77

^{1/} Planted March 21 and harvested June 30, 1966 after 100 days.

^{2/} See footnote 5, table 1. Chip color rated 0-10 from dark to light with 7 or higher acceptable.

^{3/} See footnote 4, table 1.

Alabama table 3. Yield specific gravity, and chip color of different potato varieties grown at the North Alabama Horticultural Substation, Cullman, Ala., 1966^{1/}

Variety					^{2/} Chip Color	^{4/} Specific Gravity
	1 7/8 inches and up	1 7/8-1½ inches	Below 1½ inches	Total		
	Cwt.	Cwt.	Cwt.	Cwt.		
Pungo	194	15	2	212	7.9	85
LaRouge	176	15	2	194	7.1	81
I57410-4	173	20	3	196	7.1	82
Red X	150	7	1	158	7.8	81
Snowflake	147	18	3	168	7.9	81
Viking	142	8	1	152	7.1	80
Red LaSoda	136	16	3	156	6.8	79
LaChipper	132	19	3	155	7.9	81
Keswick	121	16	3	141	7.4	86
Superior	111	17	2	130	7.8	82
Norgold Russet	96	47	8	152	5.2	83
Fundy	95	22	3	122	7.2	86
White X	89	43	9	142	5.5	83
Sebago	74	33	10	118	8.4	75
Ona	70	33	7	111	7.1	80
L.S.D. .05	43					

^{1/} Planted Mar. 21 and harvested June 30, 1966 (100 days). ^{2/} Yields followed by the same letter are not significantly different. ^{3/} See footnote 5, table 1. ^{4/} See footnote 4, table 1.

ALASKA
C. H. Dearborn

Sixteen seedlings in 4 replicates were randomized with 6 named varieties to compare productivity, frost resistance and earliness. Green Mountain is the standard for productivity and Kennebec for earliness. Alaska table 1 shows the yield characteristic of the 25 varieties. The frost resistant clone 8-60-17-61 yielded more marketable potatoes than any other variety and was third in total production of total solids per acre. This clone has very good processing qualities but its wafer shape may be in disfavor. It withstood frosting at 26° F. and grew 10 days after all other varieties were killed. This frost resistant clone appears to have as much scab resistance as Ontario.

Clones 14-58-8-62 and 1-62-90-64 are of special interest because of their desirable processing characteristics. The latter, a seedling of Stately by a frost resistant clone, is not frost resistant but is higher in solids and yields more per acre than Stately, our highest quality potato. Clone 3-59-8-61 is significant for its high percent of marketable tubers of high quality. Clone 4-58-2-60 and 11-57-1-59 produced the most tubers 3½ inches or more in diameter, although neither clone is considered an early type. Clone 3-58-48-60 is the most likely early with 28 percent of its tubers over 3½ inches in diameter.

The release of Alaska Russet in 1964 stimulated an interest in locally grown russets. Its quality and appearance appeal to many customers who hitherto have purchased imported potatoes. In the search for a better yielding russet both Norgold Russet and Russet Arenac have been tested. Norgold Russet produced at the same rate per acre as Alaska Russet but is of lower total solids. Russet Arenac is a low yielding variety in this environment. In addition, it shatter cracks badly at harvest. Neither variety seems to be an improvement over Alaska Russet.

In evaluating Louisiana's frost resistant tuberizing clones one line 21-222 showed some resistance. Some frost resistance was exhibited by several S. acaule type plants in two of 10 clones received from Minnesota.

Field frosting of a 3-acre planting of Alaska clones made it possible to select 231 seedlings with varying amounts of frost tolerance.

Approximately 15000 seeds representing 44 crosses or reciprocal crosses were sown and grown in the greenhouse.

Alaska table 1. Yield and total solids of 25 seedlings and varieties.

Variety	2"-3½"	2"-3½"	3½"+	Total	Total Solids	Total Solids Per Acre
	Cwt.	Pct.	Pct.	Cwt.	Pct.	Lbs.
8-60-17-61	508	91	6	559	20.3	11348
14-58-8-62	472	87	3	545	18.4	10028
Alaska 114	469	94	2	501	19.0	9519
Green Mountain	446	76	22	588	19.9	11701
Kennebec VF ^{1/}	428	79	17	544	19.3	10499
Ontario	396	80	14	494	18.1	8941
Kennebec	385	70	27	548	19.5	10686
1-62-115-64	381	75	12	508	19.5	9906
1-62-90-64	379	87	6	436	23.2	10115
9-60-2-62	377	79	12	479	20.8	9963
3-58-48-60	375	67	17	559	18.8	10509
4-58-2-60	363	65	34	559	16.8	9391
9-60-5-62	349	71	14	494	19.5	9633
3-59-8-61	342	91	6	374	20.3	7592
1-62-3-63	339	82	5	414	19.0	7866
11-57-1-59	336	59	30	573	20.8	11918
15-62-10-64	324	73	25	445	18.6	8277
Statel	318	81	1	392	21.8	8546
14-58-6-62	314	65	19	486	18.1	8797
9-62-2-63	294	67	12	436	19.0	8284
Alaska Russet	260	75	0	348	19.5	6786
Red Beauty	240	83	1	290	19.7	5713
3-61-1-63	220	84	0	261	21.2	5533
Russet Arenac	217	65	0	336	21.2	7123
6-58-7-60	176	69	15	254	21.4	5436

^{1/} VF = Virus X free.

ARIZONA

P. M. Bessey and N. F. Oebker

1966 Potato Trials

Trials were in three sets in 1966. Sixteen varieties or advanced selections were planted in replicated plots on February 17 and again March 17 at 7 and 14-inch spacings. Thirty varieties and selections were placed in observation plots at 7 and 14-inches on February 17. Thirty-six seedling selections from Idaho (USDA) were also planted at 7 and 14 inches on February 17. Seed of 21 of the latter were of sufficient quantity that plots could be replicated.

The Mesa Branch Experiment Station of the University of Arizona was the location for the trials on land which had been in alfalfa for several seasons. The soil was an open Laveen clay loam on which potatoes are generally well adapted. Irrigation was provided in furrows at a dead level grade so that there was no tail water. Fertilizer was applied prior to planting at the rate of 1000 lbs. per acre of 16-48-0 in two bands 4 inches to the side and 1 inch below the base of the seed piece. Twenty lbs. per acre of phorate of 10 percent concentration was applied in one fertilizer band for systemic control of psyllids and aphids. Twenty pounds of additional N per acre was applied in the furrows at mid April to satisfy an apparent N deficiency. Plots were hand planted in the replicated and observation trials to 18 seed pieces per plot for both 7-inch and 14-inch spacings. The Idaho seedling test plots were 9 seed pieces long. Row spacing for all experiments was 34 inches. Yields were converted to cwt/acre for comparable reporting.

Harvest dates were as follows: Idaho selections--June 14; Observation plots--June 16; and Replicated plots--June 25.

The major limiting factor was an extensive root knot nematode infestation which for Kennebec and Merrimack cut expected yields at least by half. The field did not have a previous history of nematodes so the problem was unexpected.

For the replicated yield trial yield differences were significant for planting date and were highly significant for spacing, variety and the date by variety interaction. Specific gravity differences were highly significant for planting date, variety and date of variety interaction. Chip yield differences were also highly significant for the same factors as specific gravity plus the effect of storage treatment. Chip color differences, however, were highly significant for variety, storage treatment and the planting date by storage treatment interaction.

Arizona table 1. Yield and specific gravity of 16 varieties planted in February and March at 7 and 14-inch spacings. Replicated plots, 1966.

Variety	Source	Yield Per Acre				Specific Gravity	
		February		March		February	March
		7 in.	14 in.	7 in.	14 in.		
		Cwt.	Cwt.	Cwt.	Cwt.		
Kennebec	Me.	153 c-e	138 d-h	104 j-r	84 m-v	73 c-d	60 j-l
Merrimack	Me.	158 c-e	140 d-g	113 h-l	77 r-w	80 a	72 c-e
Pungo	Me.	108 i-o	92 k-u	101 j-r	81 o-w	76 a-c	72 c-e
B2894-24	Me.	106 j-p	80 p-w	159 c-e	66 t-w	65 f-j	59 k-l
B5066-3	Me.	91 k-u	153 c-e	158 c-e	117 g-l	62 h-l	62 h-l
B5063-3	Me.	160 c-d	72 s-w	55 w-x	79 o-w	77 a-c	74 a-d
RD 92	Wis.	145 d-f	124 f-j	104 j-r	91 k-u	81 a	76 a-d
RD 120	Wis.	177 b-c	77 r-w	65 u-x	64 v-x	76 a-d	63 h-l
RD 311	Wis.	145 d-f	72 s-w	90 l-v	102 j-r	79 a-b	74 b-d
RD 315	Wis.	99 j-s	109 l-n	117 g-k	79 p-w	69 d-g	65 f-k
LaChipper	N.D.	123 f-j	104 j-r	95 k-s	82 n-v	69 d-f	67 e-h
Red Pontiac	N.D.	194 b	177 b-c	158 c-e	111 i-m	64 g-l	59 l
Viking (B)	N.D.	255 a	190 b	198 b	105 j-q	74 b-d	61 i-l
Viking (U)	N.D.	107 j-o	104 j-r	115 g-l	105 j-q	72 c-e	66 f-i
Red LaSoda	Wis.	92 k-u	110 i-m	60 w-x	98 j-s	66 f-j	59 l
LaRouge	Wis.	32 y	41 x-y	134 e-i	93 k-t	62 h-l	63 h-l
Means		134	111	114	90	72	66

1/ Variety notes: B5066-3 is a Kennebec by Merrimack cross; RD120 is FL2; RD 315 is Kennebec; Viking (B) and (U) differences are thought to be from date of seed harvest, handling or shipping; LaRouge apparently had not broken dormancy by the time of the February planting resulting in an unacceptably low stand and yield.

2/ Yield notes: Yield is of jumbo and "A" sized tubers. Letters indicate significant differences (.05) by Duncan's Multiple Range Test with both date and spacing factors included in the same array. Means covered by the same letter are not significantly different from each other.

3/ Specific gravity: Letters indicate significant differences (.05) by Duncan's Multiple Range Test including both dates in the same array. 1.0 omitted from all values.

Arizona table 2. Chip color and yield of experimentally stored^{1/} varieties from replicated plots planted in February and March, 1966.

Variety	Chip Color ^{3/} and Yield ^{4/}									
	Storage Regime Prior to Chipping--days					March Planting				
	February Planting									
	12	27	40	10	10	12	27	40	10	10
	days	days	days	days	days	days	days	days	days	days
	warm	warm	warm	warm	warm	warm	warm	warm	warm	warm
				+ 16	+ 16				+ 16	+ 16
				days	days				days	days
				cold	cold				cold	cold
					+ 14					+ 14
					days					days
					warm					warm
Kennebec Color	6	5	6	6	6	5	5	6	8	7
Yield	30.7	31.6	36.0	29.1	33.7	26.1	29.1	30.1	27.5	30.6
Merrimack	4	4	6	6	6	5	5	5	7	7
	31.7	32.8	38.2	30.5	35.5	28.1	30.6	31.3	31.2	34.3
Pungo	5	4	6	7	7	6	6	6	8	8
	30.6	29.8	36.1	32.2	34.3	29.3	28.7	32.8	29.9	31.7
B2894-24	4	6	6	6	7	5	5	5	7	8
	27.5	26.4	33.6	28.8	30.4	27.3	26.4	27.1	30.0	28.8
B5066-3	5	7	6	7	6	5	5	6	8	8
	27.7	31.3	32.3	28.2	31.9	28.8	26.6	33.0	26.6	31.4
B5063-3	5	6	6	7	6	6	5	6	7	6
	30.0	32.3	35.3	30.5	36.1	30.8	26.4	36.9	30.6	34.1
RD 92	4	4	5	5	5	4	4	4	6	5
	29.9	31.9	34.5	31.6	36.3	29.6	29.9	34.7	33.2	35.2
RD 120	4	5	5	7	6	5	5	5	6	6
	28.1	31.9	32.6	30.7	34.9	26.5	27.0	32.6	30.2	33.8
RD 311	5	5	6	5	5	4	4	5	5	6
	32.8	30.5	37.6	32.3	36.0	29.4	29.4	35.4	31.6	33.6
RD 315	5	6	6	7	7	5	5	6	7	7
	29.1	29.9	35.9	28.1	32.0	27.9	28.0	33.6	27.7	32.0
LaChipper	5	6	5	7	7	5	5	6	6	7
	28.3	30.1	34.4	28.4	33.5	28.5	27.0	32.0	28.3	30.5
Red Pontiac	7	7	7	8	7	8	8	7	8	8
	28.4	28.7	35.9	26.6	34.9	28.6	25.5	34.6	28.2	33.7
Viking (B)	5	5	6	7	7	5	5	5	8	7
	29.1	29.3	35.6	30.3	34.0	30.3	27.3	33.5	27.3	32.4
Viking (U)	5	5	5	7	7	5	5	6	8	7
	30.4	30.4	33.8	29.8	33.3	29.1	28.0	35.1	28.5	33.3
Red LaSoda	6	6	7	8	8	6	6	6	8	8
	26.9	27.5	29.2	27.4	32.3	26.0	25.4	31.4	29.0	30.6
LaRouge	6	8	7	8	8	6	6	6	7	8
	25.3	24.9	26.7	26.6	30.4	30.8	27.0	34.5	26.7	29.9
Means:										
Color	5.1	5.6	5.9	6.8	6.6	5.3	5.2	5.6	7.1	7.1
Yield	29.2	30.0	34.2	29.4	33.7	28.6	27.6	33.0	29.2	32.2

^{1/}Test to measure reconditioning response for chip manufacture. Warm storage at 75°F. Cold storage at 48°F.

^{2/}Variety notes as in table 1.

^{3/}Chip color as on Caughlin Color Chart: 1 = white, 10 = burned.

^{4/}Chip yield in percent of raw unwashed slices.

Arizona table 3. Yield, specific gravity, and color of potato varieties and seedlings from observation plots with 7 and 14-inch spacings, 1966.

Variety	Source	<u>1/</u> Yield Per Acre		<u>2/</u> Specific Gravity	Skin Color
		7 in.	14 in.		
		Cwt.	Cwt.		
LA 12-4	Wis.	183 a-e	172 a-f	63 i-k	Red
Superior	Wis.	104 h-n	103 h-n	75 b-d	White
LaChipper	Wis.	117 g-m	69 m-n	67 f-j	White
B4784-1	Me.	215 a-b	224 a	50 l <u>5/</u>	Light Russet
B4808-3	Me.	117 g-m	135 e-k	68 e-i	White (Lt. Rose)
B4829-7	Me.	151 c-i	138 e-k	66 g-k	White
B5090-11	Me.	141 e-k	125 f-l	66 g-k	White
B5132-3	Me.	216 a-b	199 a-d	71 c-h	Light Russet
B5282-13	Me.	178 a-f	161 c-g	76 b-d	Light Russet
B5287-16	Me.	147 d-j	126 f-l	71 c-h	White
5863-2	N.D.	99 i-n	59 n	73 c-f	White
117-13	N.D.	115 g-m	92 k-n	67 f-j	Red
HPX6	N.D.	99 i-n	114 g-m	74 c-e	Red
56179	N.D.	149 d-i	126 f-l	76 b-d	White
7627	N.D.	140 e-k	148 d-j	78 b-c	Light Russet
HPX12	N.D.	137 e-k	73 l-n	60 k	Red
148-2	N.D.	113 g-n	100 i-n	69 d-i	Light Russet
ND5899-1	N.D.	165 b-g	180 a-e	82 a-b	White
ND4524-4R	N.D.	173 a-f	142 e-k	68 e-i	Red
Norgold	N.D.	104 h-n	155 c-h	64 h-k	Russet
Norland	N.D.	101 i-n	145 e-k	66 f-j	Red
ND5778-2R	N.D.	203 a-c	156 c-h	75 b-d	Red
A466-2	Ida.	124 f-l	136 e-k	84 a	Medium Russet
Shoshoni	Ida.	145 e-k	93 k-n	60 k	Medium Russet
A589-65	Ida.	113 g-n	112 g-n	86 a	Light Russet
TL8117	La.	131 e-k	95 j-n	61 j-k	White
TL8134 <u>3/</u>	La.	156 c-h	160 c-g	72 g	Red
TL8197	La.	97 i-n	139 e-k	75 b-d	Red
Means:		140	131	70	
46125 <u>4/</u>	Colo.	58	-	72	White
TL7935 <u>4/</u>	La.	182	101	68	Red

1/Yields are of jumbo and "A" sized tubers. Letters indicate significant differences (.05) by Duncan's Multiple Range Test with both spacings included in the same array. Means covered by the same letter are not significantly different from each other.

2/Letters indicate significant differences (.05) by Duncan's Multiple Range Test. 1.0 omitted from all values. 3/Tubers of TL8134 all had hollowheart when cut for planting. No hollowheart was found at harvest. 4/Seedlings 46125 were not directly comparable to other entries in this table. 46125 was from 1964 harvested seed supplied in July 1965. This seedling was planted in buffer locations at ends of rows. Maturity was later than others above. TL7935 was misplaced in storage prior to planting consequently did not receive a preplanting warmup and was delayed several days in planting. 5/Seedling B4784-1 specific gravity was legitimate. There was no hollowheart.

Arizona table 4. Chip color and yield of experimentally stored ^{1/} potatoes from observation plots planted in February, 1966.

Variety	<u>2/</u> <u>3/</u> Chip Color and Yield				
	Storage Regime Prior to Chipping--days				
	14 days warm	28 days warm	42 days warm	+ 20 days cold	8 days warm + 20 days cold + 14 days warm
Color - Yield					
LA 12-14	6/28.6	6/28.5	6/27.1	8/27.0	7/26.8
Superior	5/30.8	5/30.3	4/27.7	6/29.0	4/28.4
LaChipper	5/31.2	4/29.9	4/28.5	8/26.6	7/25.6
B4784-1	8/26.4	9/25.4	8/23.3	9/23.5	8/24.0
B4808-3	6/28.9	6/28.4	8/26.5	8/25.9	8/25.9
B5282-13	5/31.4	5/33.0	4/28.2	6/28.8	4/29.0
B5287-16	4/32.8	5/30.6	4/29.1	6/27.7	4/28.2
B5132-3	5/30.7	5/30.0	5/28.7	6/27.9	7/28.0
B5090-11	5/29.6	5/31.6	4/27.2	6/27.1	6/26.5
B4829-7	8/31.0	7/32.1	5/27.8	9/25.9	8/26.3
5863-2	5/32.7	6/34.1	4/31.3	6/29.2	4/28.0
117-13	6/31.9	7/28.4	6/30.1	8/27.5	6/26.8
HPX6	7/31.9	6/29.9	8/32.1	8/28.3	8/28.2
56179	7/33.0	5/33.0	4/30.6	6/28.5	6/30.0
7627	5/32.8	6/27.4	5/31.1	6/26.8	6/30.1
HPX12	6/29.5	6/27.2	7/25.9	6/25.4	7/25.5
148-2	8/28.2	8/31.1	9/27.2	9/29.6	8/28.5
ND5899-1	4/35.6	5/33.5	4/32.8	6/32.3	4/30.9
ND4524-4R	4/31.5	6/30.4	6/31.2	6/28.4	7/28.1
Norgold	8/28.5	8/28.3	9/28.0	9/26.3	8/25.8
Norland	7/29.2	5/30.4	6/28.9	6/29.4	7/26.8
ND5778-2R	6/31.4	5/31.6	5/28.6	8/27.4	6/28.2
A466-2	5/35.4	5/33.8	4/32.7	6/32.5	5/30.7
TL8117	8/26.9	8/29.8	7/28.4	8/24.9	8/26.5
TL8134	5/30.7	6/30.3	5/29.3	6/26.7	8/27.0
TL8197	5/33.3	5/31.6	5/29.5	6/28.8	7/29.1
Shoshoni	7/30.4	7/28.3	7/28.0	8/26.8	8/25.9
A589-65	4/31.2	5/33.4	6/35.1	6/30.6	7/32.2
Means: Color	5.9	5.9	5.7	7.0	6.5
Yield	30.9	30.4	29.1	27.8	27.7
46125	-/-	-/-	5/33.7	-/-	-/-
TL7935	7/3.17	7/28.2	9/28.8	8/27.5	8/27.0

^{1/} As in table 2, footnote 1.

^{2/} Chip color as on Caughlin Color Chart: 1 = white, 10 = burned.

^{3/} Chip yield in percent.

Arizona table 5. Yield, specific gravity, chip color, and chip yield of 36 Idaho seedling selections planted in February at 7 and 14 inches in replicated and observation plots, 1966.

Seedling Number	<u>1/</u> Yield Per Acre		Specific Gravity(1.0 omitted)	<u>Chips 2/</u>	
	7 inches	14 inches		<u>3/</u> Color 1-10	Yield
	Cwt. Replicated Plots	Cwt. Replicated Plots			Pct.
A6216-4	149 d-h	59 n-o	1.069	6	33.5
A6238-9	108 g-n	70 m-o	57	7	26.0
A62116-1	162 c-f	145 d-h	80	4	35.1
A62144-1	116 e-m	86 k-o	85	4	35.6
A62152-1	142 d-i	89 j-o	78	5	34.8
A62152-5	207 b-c	145 d-h	68	5	32.2
A62155-3	132 e-l	91 i-o	83	4	36.5
A62155-8	165 c-e	136 d-k	74	4	34.9
A62155-9	118 e-m	81 l-o	77	5	33.0
A62155-11	158 e-g	115 e-m	65	6	32.7
A62155-12	213 b	140 d-j	83	6	35.9
A62155-14	106 h-n	55 o	81	4	37.1
A62184-1	123 e-l	113 e-m	77	4	38.9
A6356-10	129 e-l	67 m-o	64	6	31.9
A63184-7	113 e-m	106 h-n	74	6	35.5
A63184-10	159 c-g	161 c-f	70	6	32.2
A63191-2	263 a	185 b-d	65	5	27.6
A63191-3	145 d-h	143 d-i	66	5	28.5
B6008-1A	111 f-m	113 e-m	71	5	32.4
B6008-2A	138 d-k	154 e-h	65	4	28.2
B6008-3A	163 c-e	82 l-o	84	4	33.4
Means	145	114	1.073	5.0	33.1
<u>Observation Plots</u>					
A6216-1	185	140	85	4	37.4
A6238-7	139	149	74	5	33.6
A62136-2	195	125	62	5	32.6
A62114-4	323	117	84	4	33.8
A62148-2	27	39	84	4	33.5
A62148-5	86	(no plot)	(no record)	5	38.9
A62148-8	140	74	79	4	34.7
A62148-10	126	87	80	5	37.4
A62156-1	192	99	86	5	39.7
A62180-3	110	109	75	6	36.6
A62180-4	(no record)	90	75	5	34.7
A62184-3	108	92	72	5	38.4
A63184-8	172	125	75	6	36.4
BR5973-1A	155	99	67	4	28.6
BR5975-1A	176	153	87	4	33.2

1/ Yields are of jumbo and "A" sized tubers. Letters indicate significant differences (.05) by Duncan's Multiple Range Test with both spacings included in the same array.

2/ Samples were stored at 75° F. from harvest until chipping July 22 and August 3.

3/ Chip color as on Caughlin Color Chart: 1 = white, 10 = burned.

CALIFORNIA
Glen N. Davis

Potato experimental work was conducted at Tulelake, Shafter, and Davis in 1966.

(a) Tulelake: Seventeen named varieties and 12 advanced generation seedlings were grown in a replicated yield test plot. Data were collected on yield, appearance, specific gravity, and chipping suitability (chipping and chip rating was by a commercial cooperator). The variety, Russet Burbank, was considered the check.

Ten of the named varieties and two seedlings produced a significantly higher yield than the check. The check produced 437 one-hundred pound sacks per acre while the top seedlings (White Rose x Merrimack) produced 517 sacks per acre and the other (White Rose x B3696-13) produced 484 sacks per acre. Both seedlings are resistant to verticillium wilt. Four named varieties and 3 seedlings had a higher specific gravity than the check. Results are presented in California table 1.

(b) Shafter: Seventeen named varieties and 10 advanced generation seedlings were grown in a replicated yield test. The variety, White Rose, was considered the check. No single variety or seedling exceeded White Rose in yield per acre. However, 9 varieties and 7 seedlings produced tubers having a higher specific gravity than those of the check. The highest specific gravity recorded was a seedling (Houma x Merrimack) with a reading of 1.103. A reading this high is exceptional. See California table 2.

Twenty-two seedlings were tested for scab resistance in naturally infested soil with White Rose and Kennebec as checks. The degree of infestation in the soil was apparently too low to give a reliable test. The results were disappointing.

Three thousand, five hundred seedlings were grown in single-hill plantings and evaluated for specific gravity and horticultural characteristics. Twenty-three were selected for further testing in replicated plantings.

Davis: Approximately 4000 seedlings were grown from true seed resulting from crosses representing 43 different parental combinations. These will be in single-hill plantings at Shafter in the spring of 1965.

Seventeen seedlings selected in the field for high specific gravity and desirable horticultural characteristics were tested for resistance to verticillium wilt using the tooth-pick test. Seven proved to be resistant, 2 were intermediate in their reaction and 8 were classed as susceptible. See California table 3.

Seed of the 1966 single-hill selections was increased in the field for use in 10-hill and replicated plantings at Shafter and Tulelake in 1965.

California table 1. Potato yield test, Tulalake, California, 1966

Clone	Yield Per Acre	Specific Gravity	Clone	Yield Per Acre	Specific Gravity
	Cwt.	<u>2/</u>		Cwt.	<u>2/</u>
White Rose	507	68	Platte	429	73
Netted Gem	437	76	Nebraska 156	197	92
Kennebec	544	-	White Rose x Merrimack	387	64
Merrimack	427	83	" " "	517	76
Ona	472	72	" " "	390	77
Red Pontiac	603	67	" " "	283	64
Norgold Russet	492	72	White Rose x B3696-13	393	71
Viking	491	69	" " x "	484	64
Pennship	568	74	Houma x Merrimack	395	81
Monona	510	66	White Rose x V21-43	287	77
Alleghanna	590	65	Merrimack x B4828-4	356	71
LaChipper	511	79	" x "	394	70
Brown Beauty ^{3/}	562	79	B5851	262	70
Red Beauty	236	77	B5852	452	67
Anoka ^{3/}	520	67			
LSD .05	50				
.01	66				

1/ Fertilizer--600 lbs. per acre of 16-20-0

2/ 1.0 omitted from readings. 5 replications of 25 seed pieces each.

3/ Not included in the analysis.

California table 2. Potato yield test, Shafter, California, 1966^{1/}

Clone	Yield Per Acre	Specific Gravity	Clone	Yield Per Acre	Specific Gravity
	Cwt.				
White Rose	485	1.081	Nebraska 156	262	101
Kennebec	342	090	White Rose x Merrimack	338	084
Merrimack	261	101	" " x "	263	090
Ona	267	088	" " x "	220	097
Red Pontiac	438	075	" " x "	241	078
Norgold Russet	330	080	" " x B3696-13	280	080
Viking	336	076	" " x "	318	071
Pennship	432	088	Houma x Merrimack	267	103
Monona	335	086	White Rose x V21-43	293	093
Alleghanna	418	079	Merrimack x B4828-4	306	090
LaChipper	440	082	" x "	250	076
Brown Beauty	357	086	B5851	166	071
Red Beauty	370	083	B5852	307	078
Anoka	390	076	"	322	082
Platte	347	078	Russet Burbank	205	080
LSD .05	60				
.01	80				

1/ Fertilizer = 600 lbs. per acre 16-20-0.

5 replications of 25 seed pieces each.

California table 3. Test for Verticillium wilt resistance (greenhouse).

Clone	Rating ^{1/}
91-87	S
91-201	R
91-381	S
93-32	R
93-150	I
101-271	I
137-3	S
143-9	S
198-10	R
198-23	R
198-37	R
205-13	S
165-271	S
168-57	S
168-45	S
118-321	R
149-153	R

^{1/} R = resistant, I = intermediate, S = susceptible

CANADA (Ontario)
G. R. Johnston and R. G. Rowberry

Discussion of the Entries in the Ontario Regional Potato Variety Trials of 1966
in Comparison with the Standards--Irish Cobbler, Kennebec, and Sebago
(This Trial was Conducted at Seven Stations in Ontario)

Norgold Russet: 3rd successive year in the Ontario Regional Trials. Vines mature medium-early but are not as vigorous as those of Cobbler or Kennebec. Tubers are oblong to long, generally smooth in conformation with shallow eyes and a golden brown, netted skin. However, some rough and knobby tubers were occasionally noted. Lack of size was common at locations where soil moisture was limited. Tubers practically free of scab but some *Rhizoctonia* black scurf occurred. A few growth cracks and "thumbnail" harvest cracks were found at some locations. Will sprout early unless storage temperature is controlled at 40° F. The yield was down at most stations in 1966, especially at those that encountered much below normal rainfall and weren't able to irrigate. The specific gravity was lower than the standard varieties. As a boiler, Norgold is equal to Cobbler with the advantage of very white cooking color but ranks with Sebago as a baker. It is definitely not a chipper. It has some possibilities as a french frier. Where good tuber size is attained, the tuber shape lends itself well for cutting into frying strips. Norgold Russet requires good soil moisture and fertility conditions to achieve its potential. It is already in the Ontario Zonal trials and no further testing in the Regional Trial should be required.

Superior: 3rd year regionally. Vines mature early to mid-season depending on location. Tubers size early. Vines are vigorous. Tubers are blocky in conformation but more attractive and uniform than Cobbler. Medium-deep eyes. Flaked to slightly netted, tan-colored skin. Scab-free. Only Bradford reported much *Rhizoctonia* black scurf. Silver scurf is masked by the rough skin. A few harvest cracks at Ottawa. The tough skin resists skinning and bruising at harvest. Yields not quite up to Kennebec. S.G. equal to Cobbler. As a storage potato some difficulty has been encountered with after-cooking discoloration. This has not been the case with freshly dug tubers of Superior. The chipping results for Superior were not as good as in previous years. Although it has some good french fry ratings the tuber conformation is not desirable for cutting. Superior is also in the Zonal Trials and no further testing is required in the Regional Trials. It would appear that Superior could have a place as an early variety for the "basket" trade and as an early chipper. It compares very favorably to Cobbler in maturity, yield and specific gravity and has the advantages of high scab resistance and attractive washed appearance.

Anoka: A Minnesota introduction. 2nd year in Regional Trial. Vines mature medium-late and are not as vigorous as those of Cobbler or Kennebec. Tubers round, slightly flattened, bright, clean with mostly a flaked skin and shallow eyes. At locations where soil moisture was insufficient tuber sizing was not very good. Tubers were mostly free of skin defects such as scab, rhizoc and silver scurf. Resists harvest skinning and bruising. Equal to Sebago in yielding ability but the specific gravity readings were unimpressive. With a few exceptions the cooking scores were mediocre in 1966. Not equal to Kennebec as a chipper. Following 53° F. storage, made excellent french fries from the Preston Station. Most other french fry scores were borderline to poor. Not recommended for further trial regionally in Ontario.

FG3524-2: 2nd year regionally. Vines mature medium-late and are vigorous. Tubers are roundish, uniform, attractive with a distinctly flaked skin and medium deep eyes. Resistant to silver scurf, tolerant to scab and occasionally dotted with a small percentage of Rhizoctonia black scurf. Not equal in yield to the standards at several locations in 1966, but equal to Cobbler and Sebago in specific gravity. With the exception of Harrow, generally good culinary scores in the boiling and baking tests. Poor french fry scores from all locations except Ft. William. In the Smithfield chip tests, FG3524-2 made acceptable chips from five of the seven locations, following 53° storage only. Following 60-62° storage, on all nine successive commercial-run chipping tests conducted by the Hostess Food Products, Preston, Preston-grown FG3524-2 potatoes produced very light colored, uniform chips. The tuber samples also stored very well. FG3524-2 should be considered for advancement to the Zonal Trials on at least a limited basis in 1967 and continued for a 3rd year regionally.

ND3022-18: 2nd year regionally. Vine maturity varies from early to medium-late depending on locations. Tubers size with Cobbler. Tubers are round, very smooth, shallow-eyed and quite free from off-shapes. Two skin types were found at every location--smooth, white; and flaked to netted tan-colored. Tolerant to scab and rhizoc. Resistant to silver scurf. Internal necrotic brown spots occurred at both Simcoe and Harrow. Tuber set is medium. Yield is comparable to Cobbler and Sebago as is the specific gravity. Generally a good boiler (resists sloughing) and a fair to good baker. Poor chipper and with one exception (Smithfield, following 40° storage and conditioned) only a fair to poor french frier. In comparison to the standards it is doubtful if ND3022-18 merits further trial in the full regional trial. It could have some possibilities as an "early" in the Essex County area. In the Harrow trial it yielded with Kennebec and sized with Cobbler and had much better tuber conformation than Cobbler.

F5850: 1st year regionally. Vines mature medium-late to late. Tubers size with Kennebec. Vines are vigorous. Tubers are white-skinned, round to oblong, smooth, uniform and shallow-eyed. Susceptible to scab and silver scurf. Tolerant to rhizoc. The scurfy type of scab present at some locations detracts a little from the appearance. Ottawa reported some hollow heart. Tuber samples from all stations sprouted early in 50° F. storage. Three of seven stations reported moderate to severe internal necrotic brownish spots, probably caused by the hot, dry weather of June and July. The tuber set is medium and the yield comparable to Sebago and Cobbler but lower than Kennebec. The specific gravity was generally lower than all three standard varieties (except at Preston). The boiling and baking ratings were fair to good depending on location. Some after-cooking darkening was occasionally found. In only 3 out of 14 scores was F5850 rated as a good french frier. In the chip trials at Smithfield, F5850 was rated the best chipping prospect. Its superior chipping quality was confirmed by commercial chip trials at both Hostess and Salada. It was the only variety to make acceptable chips following 40° storage, conditioned 2 weeks at 70° F. It was the only variety to make acceptable chips from the organic soil trial at Bradford. The main faults of F5850 appear to be (1) early sprouting unless storage temperatures are controlled at 40° F. or a sprout inhibitor is used (2) susceptible to scab and (3) susceptible to internal necrotic spots in a hot, dry growing season. However, F5850 should be further evaluated regionally and entered into the Ontario Zonal Trials of 1967.

Fbr3965-7: 1st year regionally. Vines mature very early to early and tubers size early. Vines are moderately vigorous. Fbr3965-7 apparently does not compete well with other adjacent varieties when it is grown in single-row plots, especially if (a) the adjacent varieties are later maturing and vigorous or (b) the season is unusually dry and irrigation water isn't available. The tubers are roundish, slightly flattened, very smooth in conformation with shallow eyes and a flaked to slightly netted, tan-colored skin. Tolerant to scab and rhizoc. Resistant to silver scurf. Resistant to harvest skinning. Occasional hollow heart noted in large tubers at Ottawa. The tuber set is only medium. The yield in single-row plots, in competition with other varieties, was somewhat disappointing. In Block Trial plantings on growers' farms in organic soil at the Bradford and Thedford marshes and in a Block Trial at the Organic Soil Research Station, Ste. Clothilde, Quebec, Fbr3965-7 yielded very well in comparison to standard varieties such as Ontario, Cherokee, Katahdin and Kennebec. In general the specific gravity readings were very good. At the Bradford replicated trial the S.G. was much lower than in past years there. In the Block Trial Plantings it averaged around 1.080, which is high for organic soil. Fbr3965-7 had good to very good boiling and baking scores. The organic soil growers rated it much better than the Ontario variety and better than Cherokee. Following 53° F. storage it made acceptable chips from all stations except Bradford and Ft. William. A sample of tubers from one of the Block Trials at Bradford, held at 50° F. before frying in January, made very acceptable chips in a test run through the Hostess commercial frier. Following 53° storage only, Fbr3965-7 made good to very good french fries from two stations only--Bradford and Simcoe. It would appear that Fbr3965-7 is best adapted to organic soils. There seems to be some controversy over the acceptability by packers of a muck-grown variety with a roughened (flaked) tan-colored skin even if the quality is superior to presently grown white-skinned varieties. Fbr3965-7 was started in the Elite seed program in 1966. It will be increased in 1967 for possible release in 1968. Meanwhile, it should be further tested on organic soil in 1967.

B5141-6: 1st year regionally. Vines mature medium to very late depending on location. Tubers size late like Sebago. Vines are moderately vigorous. Tubers are generally roundish, white-skinned, medium-sized with shallow eyes. Off-shape sometimes occurs. The tubers tend to skin at harvest unless the tops have been dead for a couple of weeks. Susceptible to scab and silver scurf. Tolerant to rhizoc. Tubers sprout very readily in storage unless temperature is controlled at 40° F. or an inhibitor used. There is a good set of tubers with medium size predominating. Lack of size in a dry year could be a problem. Lower yielding than the standards at most locations. Significantly higher in specific gravity than any of the other 17 varieties at all 7 stations (average of 1.095). Very good cooking scores at all stations in spite of a little stem-end, after-cooking darkening occasionally showing up. The cooked texture is very dry and also very fine and there was no sloughing when boiled. Second only to F5850 as a chipping prospect. Acceptable chip scores following 53° storage at all stations except Bradford. Didn't condition as well following 40° and 2 weeks at 70° as did F5850. Following 60-62° storage at Hostess, made very light chips at all nine of the testing dates, November 28, February 6. B5141-6 had the best overall french fry ratings in the trials; 12 out of 14 acceptable scores. However, the lack of tuber size could limit its usefulness for cutting into french fry strips. B5141-6 is worthy of retrial regionally in 1967 and perhaps some limited grower trials.

B5063-3R: 1st year regionally. Vine maturity varies from early at Ft. William to very late at Bradford. Tubers sized early at Ft. William and late at most other locations. Vines are quite vigorous. Tubers are Cobblerish in shape, pink-skinned, with medium-deep eyes. Susceptible to rhizoc. Tolerant to scab. Resistant to silver scurf and greening. Susceptible to harvest skinning, bruising and cracking if tops are not vine-killed well before harvest. Resistant to virus Y and leaf roll. Highly resistant to the races of verticillium wilt in the Preston wilt nursery. A heavy setter of mostly medium-sized tubers. Yields are comparable to Kennebec and tuber size is more desirable for tablestock pack. High specific gravity readings (1.083 average). Good to excellent cooking scores at all stations. Resists after-cooking darkening. Sloughed moderately when boiled for 5 out of 7 locations. The french fry scores were mostly mediocre and the tuber conformation is poor for cutting into strips. Only from Preston did B5063-3R make good chips-- both following 53° storage and 40°, conditioned 2 weeks at 70°. It was equal to Kennebec in the Hostess commercial chip tests (Preston grown). Grown at Alliston and chipped by Salada, the color of the chips was not acceptable. B5063-3R is worthy of retrial in 1967. Its pink skin may be a drawback to commercial acceptance.

B5132-9: 1st year regionally. Vines mature from very early to midseason depending on locations. Tubers size fairly early. Vigorous vines. Tubers are generally roundish with shallow eyes and a distinctly flaked skin. The tuber shape tended to be a little rough at some locations. Resistant to scab. Tolerant to rhizoc. Silver scurf when present is well masked by the rough skin. Internal necrotic spots at Simcoe. Set is medium. Yield was generally comparable to Cobbler as was the sizing. The specific gravity was somewhat low on the average. The cooking scores were unimpressive. Chipping scores were generally poor. Following 53° storage only, B5132-9 made very good to excellent french fries from Bradford and Ft. William only. Not worthy of further trial regionally.

B4744-23: 1st year regionally. Vines mature early. Tubers size fairly early. Vines are vigorous. Tubers are roundish, fairly uniform, with shallow eyes and usually a flaked skin. At Bradford there was patchy netting on the skin. Resistant to silver scurf. Tolerant to scab and rhizoc. Medium set of medium-sized tubers. Lower yielding than the standard varieties, but comparable to them in specific gravity readings. With the exception of Bradford and Harrow, good to very good boiling and baking scores. Except for Ft. William, unsatisfactory for chipping. Nine out of 14 acceptable french fry scores but sizing could be better for cutting. Not worthy of further trial regionally.

P5814-1: 1st year regionally. Introduction from private breeder in North Dakota (Picha). Vines mature early to medium depending on location. Tubers size fairly early. Moderate to strong vine vigor. Tubers are oblong, generally smooth, shallow-eyed with a flaky, tan-colored skin. The Bradford sample greened readily when exposed to light. Resistant to silver scurf. Tolerant to scab and rhizoc. Some powdery scab reported from Ft. William. Some hollow heart at Harrow. Yield and specific gravity comparable to Cobbler. Fair to good boiler and baker. A little stem-end discoloration occasionally noted. Following 53° storage produced good french fries from Ottawa and Simcoe only. Chip scores mainly unacceptable in the Smithfield tests. Not recommended for further trial regionally.

P177-13R: 1st year regionally. Also from private breeder in North Dakota. Vines were moderately vigorous and matured in mid-season. Tubers size fairly early. Tubers have bright red skin and are blocky in shape with medium deep eyes. There is a tendency to oversize and large tubers are often rough with occasional growth cracks. The plants at Preston and Bradford were heavily attacked by *Rhizoctonia* and many of the tubers were badly deformed. The performance of this variety was very variable--good at some locations and poor at others. Susceptible to rhizoc and silver scurf (25% at Simcoe). Scab tolerant. Outyielded both Cobbler and Kennebec at Simcoe and Harrow. Low yields at some stations. Specific gravity a little lower than the standards. Unimpressive cooking scores. Unsatisfactory frying results. P177-13 may have some value as a late summer harvested red-skinned variety. The tubers are earlier sizing, much smoother and more attractive than Red Pontiac. Discontinue in the full regional trial.

MS425-2L: 1st year regionally. Only grown at four stations--Harrow, Simcoe, Preston and Bradford. Vines mature medium-late. Tubers size somewhat late. Moderately vigorous vines. Tubers are roundish, smooth, uniform in shape but somewhat lacking in size. Shallow eyes. Smooth, white skin. Tolerant to scab, silver scurf and rhizoc. Compared to the standards--smaller tuber size, lower yielding and equal in specific gravity readings. Fair to poor cooking scores. Generally poor chipper and french frier. Discontinue further testing.

Fbr3980-4: 1st year regionally. A Bradford selection from Fredericton-bred, unselected seedling. Tested only at four stations--Harrow, Simcoe, Preston and Bradford. Tubers size early--as early as Cobbler at Harrow. Vines moderately vigorous and medium maturity. Tubers are roundish generally, smooth in shape, shallow-eyed with smooth skins. The tubers were clean and attractive at Harrow. They skinned badly in July harvest at Simcoe. At Preston the tuber surface was marred by some type 2 scab, silver scurf and black scurf (*Rhizoctonia*). Bradford also reported some scab and rhizoc. The stolons tend to be somewhat thick and adhere to some extent at harvest. Yield is comparable to Cobbler and the specific gravity is higher than the Standards. Cooking scores were fair to good. Acceptable chips following 53° storage from Harrow and Simcoe and acceptable french fries from Simcoe (53° only). Fbr3980-4 may have some value as an early in the Norfolk and Essex County areas but other than that should be discontinued regionally.

KEY TO THE RATINGS USED IN ALL TABLES FOR VINE, TUBER AND CULINARY CHARACTERISTICS

<u>Maturity (Vines)</u>	<u>Type</u>	<u>Plant Vigor</u>
1 - very early	1 - round	1 - very weak
2 - early	2 - oval	2 - weak
3 - medium	3 - oblong	3 - moderate
4 - late	4 - long	4 - strong
5 - very late		5 - very strong
<u>Appearance</u>	<u>Eye Depth</u>	<u>Yielding Ability</u>
1 - excellent	1 - shallow	1 - high
2 - good	2 - medium	2 - medium
3 - fair 4 - poor	3 - deep	3 - low

Type of Scab: 1 - small, superficial pustules; 2 - larger, superficial; 3 - large, rough or corky; 4 - small, shallow pits; 5 - large, deep pits

Note: Amount of scab is given as a percentage, e.g. 10/3 is 10% of the tuber surface covered with a rough, corky type of pustule.

Ontario table 1. Potato variety or seedling performance notes--Cooperator: G. R. Johnston and R. G. Rowberry
 Location: Preston Adaptation Trial Year: 1966 Planted: May 31, June 2 Harvested: Oct. 12-14

VARIETY OR SEEDLING	TUBER CHARACTERISTICS					YIELDING ABILITY	SPECIFIC GRAVITY	REMARKS
	MATURITY	PLANT VIGOR	TYPE	APPEARANCE	EYES-DEPTH			
Sable	2	3	1	2	1	28*	1.060	Very early sizing check. Well-sized, smooth tubers. Practically scab-free. Silver scurf 5%. Rhizoc 2%.
Irish Cobbler	2	3	1	4	3	26	1.071	The standard early variety in Ontario. The typical rough, irregular tubers for this station. Si.sc.-2%. Scab 5/4 and rhizoc 5%.
Norland	2	3	1	2	1	24	1.064	Early red-skinned check variety. Smooth, attractive tubers with a mild netting. Si. sc. 10%. 2% russet scab.
Kennebec	4	4	3	3	1	26	1.071	The standard maincrop check variety. Large tubers that often are irregular in shape. Oversizing common. Si.sc. 30%. Scab 2/2. Trace of rhizoc.
Red Pontiac	4	4½	1	3	3	30	1.064	Maincrop red-skinned check variety. Good yield of somewhat large and rough tubers. Rhizoc 10%. Russet scab 10%.
Sebago	4½	4	1	2	1	24	1.068	Late maturing check variety. Generally smooth tubers with prominent lenticels. Some hollow heart on large tubers. Scab 4/2. Free of si. sc.
Grand Falls	4	5	3	4	1	20	1.076	Somewhat irregular in shape. Some knobby tubers. Scab 10/1. Chipped Feb. 3, following 40°, conditioned 2 weeks at 70°-65 rating (barely acceptable).
F5889	2	3	1	3	2	15	1.069	Seed received from Manitoba. Yield and appearance <u>not</u> impressive. Flaky skin. Shape is somewhat Cobblerish. Quite a number of undersized tubers. Skin is almost free of defects such as scab, silver scurf and rhizoc. Chipped February 3 following 40°, conditioned 2 weeks at 70°-80 rating (quite acceptable).

continued

Ontario table 1, continued.

Monona	3	3	1	3	2	20	1.065	Irregular shaped tubers that sized well. 5% rhizoc. 10% si.sc. Chipped Feb. 3 following 40° storage, conditioned 2 weeks at 70° produced light-colored, uniform chips with rating of 85 (very acceptable). Chip flavor was a little "stronger" than those of Kennebec. May have possibilities as a chipper from "cold" storage with a minimum period of "conditioning." S.G. is somewhat low, however.
ND5899-1	2½	4	1	2	1	23	1.080	Uniform, medium-sized tubers with 20% si.sc. Chipped following 40°, conditioned 2 weeks at 70° produced acceptable chips (70 rating) but the pith section was invariably darker than cortex. A longer conditioning period or storage at 45° rather than 40° might have improved the chip color. Worthy of regional trial in Ontario in 1967. Good S.G.
I57410R	4	3	1	1	1	16	1.064	Medium yield of bright red, very attractive, smooth tubers. Skin is very free of defects.
Peconic (NY1)	3	3	1	2	2	18	1.076	Medium-sized, roundish, uniform tubers with a sl. flake on skin. Free of scab and si.sc. New York State reports that it chips well after a "few" weeks "conditioning" following 40° storage. Highly resistant to golden nematode in Newfoundland.
Bake-King (NY3)	3	3	4	3	1	18	1.077	Long type but irregular shape. Med. flaked skin. Trace of skin disease.
B5019-6	2½	3	1	2	1	18	1.076	Uniform, medium-sized tubers with sl. flaked skin. Scab-free.
B5267-2	2	3½	3	2	1	16	1.073	Early maturing. Very clean skinned, medium-sized, sl. irregular shaped tubers. Reported res. to X, A and IR.
B5282-13	2	3½	2	2	1	22	1.073	Early maturing. Shape is a little irregular. Skin is very free of defects. Reported res. to X and A and a chipping prospect. Chipped on Feb. 3 following 40° and conditioned 2 weeks at 70° produced borderline color rating of 60. May need longer conditioning.

continued

Ontario table 1, continued.

B5287-10	3	4	1	2	1	33	1.063	Good set and yield of uniform tubers. 5% russet scab. Reported resistant to X, and A and greening. USDA considers it a potential soup processor.
B5287-16	3	4	1	3	1	30	1.071	Good set and yield of round, smooth tubers. 10% rhizoc. Scab 5/1. Reported resistant to X, A, Y and greening.
B4987-16	3	4	1	2	1	24	1.063	Round, smooth tubers. Some undersizing. 5% rhizoc. Reported resistant to X, A and Vw. Scab-free.
Pioneer	3	4	3	2	1	23	1.074	Oblong, smooth, medium red skinned tubers that are free of scab, si.sc. and rhizoc. Chip rating (40° plus 2 weeks at 70°)--50 (too dark for Ontario market).

Ontario table 2. Potato variety or seedling performance notes--Cooperator: G. R. Johnston and R. G. Rowberry
 Location: Preston Year: 1966 Planted: May 18 Harvested: September 12

VARIETY OR SEEDLING	VINES		TUBER CHARACTER- ISTICS			YIELDING ABILITY	SPECIFIC GRAVITY	REMARKS
	MATURITY	PLANT VIGOR	TYPE	APPEAR- ANCE	EYES DEPTH			
Sable	2	3½	1	2	1	330*	1.060	Outstanding characteristics plus a descriptive account of the presence of disease. NOTE: Only those clones that are being retained for further trial and increase are reported. * Yields of tubers 1 7/8 inches and over, in cwt. per acre--each is a mean of 3 replications.
Kennebec	4	4½	3	3	1	388	1.082	Large, generally smooth, uniform tubers. Some oversize by Sept. 12. Scab free. Rhizoc 5%. Resisted skinning on Sept. 12. Early sizing check variety.
Fbr4186-6	3	3	1	2	1	268	1.075	Generally oblong but considerable irregularity of shape. Some oversize. Scab 10/2.
Gbr6032-2	2	3	1	1	1	285	1.075	Fairly uniform tubers with flaky, tan-colored skin. Almost scab-free. This seedling is apparently better adapted to organic soil than to mineral. Retrial at Bradford and increase seed at PRS.
B5236-21	3	3	1	2	1	244	1.073	Early maturing, white-skinned, roundish tubers that are scab-free. However, it appears to be better adapted to organic soil than mineral. Retrial at Bradford. Incr.seed at PRS.
ND4524-4R	4	4	1	1	1	327	1.072	Medium set of medium sized, round, smooth, uniform tubers but yield could be higher. Res.to X and A viruses (USDA). Scab 5/1. Skin is mod.flaked. Repeat in replicated trial.
Fbr4193-8	3½	3	1	1	1	282	1.073	Bright red skin that is sl.flaked. Very uniform, smooth tubers. Good set. A little russet scab but not very noticeable. Recommended for the 1967 Ontario regional trial.
Wash.48-1	4	4	1	2½	1	314	1.083	Fairly uniform tubers that are very clean and bright. Scab-free. Not as high yielding on mineral soil as on organic. Repeat in replicated trial at PRS and Bradford 30-ft.trial. Increase seed at PRS.
ND5778-2R	3½	4	1	2½	1	331	1.079	Clean, bright, scab-free tubers that had sized fairly well by Sept.12. Tubers are a little irreg.in shape. Good setter. Dr. Busch reports it as highly res.to the PRS races of vert. wilt. Recommended for the 1967 Ontario regional trial.

Tubers with fairly good uniformity of shape and size. Medium red skin. A little russet scab. Well-sized by Sept. 12. High set and a good yield potential. Recommend for the 1967 Ontario regional trial.

CANADA (British Columbia)

A. R. Maurer

USDA Seedlings Tested at Agassiz, British Columbia, 1966.

Five new seedlings were tested in 1966, along with 9 retained from previous tests. Of these, 4 were held as a seed source for golden nematode resistance trials, and 5 for further testing and multiplication. All the new seedlings claiming blight resistance were tested in the blight resistance plot, and those showing considerable resistance in previous years were retested.

Two were in an early yield trial, one in a second early yield trial, and two in the late variety yield trial.

Specific gravity was taken and cooking tests carried out on all seedlings.

Warba was used as the comparison standard in the early trials, Kennebec in the second early trial and Netted Gem in the late trial.

Frying tests were carried out with tubers from late harvested adaptation plots.

Silver scurf was very prevalent this year, being so severe that it caused several seedlings to be so unattractive as to be useless for the fresh market.

Results are given in British Columbia table 1.

Nematode Resistant Potatoes--Vancouver Island^{1/}

Purpose: To determine the number of larvae hatched from a Heterodera rostochiensis cyst population that can reach maturity on potato varieties and seedlings.

Method: 1. The cysts

- a. The cysts used in the tests were cultured from cysts collected from Thompson Sr., infected field, Vancouver Island, on potatoes in the lab during the summer of 1965, and were approximately 1 year old.
- b. The cysts chosen for the tests were full (resisted gentle pressure) and of uniform size.

2. The potato plants

- a. The following varieties and seedlings were used in the tests.

Variety	Number Seedlings Used
B4846-2	3
B4846-14	2
B5036-40	4
B5287-5	4
B4523-8	2
B4557-2	3
B5459-7	3
B5463-1	2
Pontiac	1
Kennebec	1

- b. The potatoes were started in peat and then were transplanted individually into pots containing a mixture of sand and peat.

^{1/} Work done by the Plant Protection Division, C.D.A.

- c. When the potatoes had developed abundant top growth, a root diffusate was collected, by leaching, from each variety and placed in jars.
 - d. After the root diffusate had been collected each seedling was inoculated with 50 cysts.
3. The root diffusate was used to determine the average hatch per cyst for each potato variety in the following way:
- a. 2 ml of diffusate was placed in a small stender preparation dish.
 - b. 20 cysts were placed in the diffusate.
 - c. The hatched larvae were counted every week for 5 weeks. After every count the old diffusate was discarded and replaced with fresh diffusate.
4. The inoculated plants
Approximately 90 days after inoculation, the roots of each plant were removed from the soil and washed with a high pressure water jet. The cysts dislodged in this manner plus those recovered by floatation from the soil in which the potato was growing were placed in vials labeled with the potato variety from which the cysts were removed.
- The contents from all the cysts were then examined and the following criteria used to distinguish new cysts from parent cysts:
- a. Cysts with reduced egg mass and many empty egg shells, were considered to be of the parent generation.
 - b. Cysts full of eggs, showing remnants of the gelatinous matrix surrounding the eggs, with very few or no empty egg shells, and containing many immature eggs were considered to be newly formed cysts.

- Results:
1. Larvae hatch (B.C. table 2)
 - a. Determination of average hatch per cyst for each potato variety.
 - b. 20 cysts placed in 2 ml of diffusate.
 - c. Readings taken at 1 week intervals for 5 weeks.
 2. The percent of hatched larval populations reaching maturity (British Columbia table 3)

Seedling Number	Years tested	Yield Per Acre		Specific gravity	Late blight rating	Cooking Scores				Remarks
		Mkt.	Total			Boil	Bake	French Fry	Sara- toga chip	
		Cwt.	Cwt.							
B4809-7	3	(E)150	170	1.064	2	77	74	60	65	Susc. to silver scurf--90%. Poor appearance.
B4846-2	3			82	-	63	63	60	60	Retain for Golden Nematode res. trial.
B4846-14	3	(L)262	326	101	-	76	89	75	70	Retain for G.N. res. trial.
B5036-40	3			78	-	71	84	70	70	G.N. res. trial.
B5090-11	3	(L)282	344	75	2	60	67	60	65	"Soup" type. Poor table quality.
B5141-6	3	(S)270	318	99	-	59	77	85	90	Good quality--too many small size.
B5267-2	2	(E)138	172	77	-	54	66	75	80	Fair quality--tend low yield.
B5287-5	2	Fair yield		70	-	71	69	70	70	Rough tubers, poor quality. G.N. res.
B5299-39	2	Fiar yield		73	-	75	74	70	75	Only fair quality--not outstanding
B4523-8	1	Good yield		81	1	71	79	70	70	Only fair quality. Some knobby. Retest blight.
B4557-2	1	Good yield		78	1	67	66	65	65	Almost too thin, flat. Late blight retest.
B5422-9	1	Fair yield		79	2	84	76	80	70	Early trial 1967.
B5459-7	1	Good yield		81	9	77	74	70	75	Susc. to silver scurf. Growth cracks.
B5463-1	1	Good yield		77	-	62	69	60	65	Early trial 1967.
Warba	Std.	(E)184	208	73	9	80	-	-	-	
Kennebec	"	(S)318	364	81	-	81	88	85	75	
Netted Gem	"	(L)234	288	98	-	80	89	80	85	

1/ (E) = early trial

(S) = second early trial

(L) = late trial

British Columbia table 2. Larvae hatch for 10 seedlings and varieties. No. of larva hatched.

Number of Weeks in Diffusate	B4846-2	B4846-14	B5036-40	B5287-5	B4523-8	B4557-2	B5459-7	B5463-1		
1st week	1005	484	694	613	1566	195	1000	450	346	2196
2nd week	20	133	68	47	121	61	236	12	66	69
3rd week	19	146	95	310	379	2	180	15	76	71
4th week	-	-	-	-	-	-	-	-	-	-
5th week	121	170	91	625	335	7	283	96	407	70
Total No. over 5 weeks	1233	933	948	1595	2401	266	1699	573	895	2406
Average hatch per cyst over 5 weeks	61	46	48	79	120	14	84	28	44	121

British Columbia table 3. Percentage of hatched larvae reaching maturity.

Variety	Seedlings	Cysts per Seedling	Total cysts in parent population	Expected larvae hatch from parent pop. $\frac{1}{}$	New cysts formed	Larva reaching maturity = No. new cysts x 100 / expected hatch $\frac{2}{}$
	No.	No.	No.	No.	No.	Pct.
B4846-2	3	50	150	9150	8	.09
B4846-14	2	50	100	4600	3	.07
B5036-40	4	50	200	9600	2	.02
B5287-5	4	50	200	15800	3	.02
B4523-8	2	50	100	12000	5	.04
B4557-12	3	50	150	2100	1	.05
B5459-7	3	50	150	12600	10	.08
B5463-1	2	50	100	2800	5	.18
Pontiac	1	50	50	2200	947	43.04
Kennebec	1	50	50	6050	999	16.51

$\frac{1}{}$ Expected hatch = Hatch per cyst x number cysts.

$\frac{2}{}$ Pct. Larva = New cysts x 100/expected hatch reaching maturity.

Summary: For the varieties B4846-2, B4846-14, B-5036-40, B5287-5, B4523-8, B4557-12, B5459-7, and B5463-1, less than .2% of the hatched larval population reached maturity.

For the varieties Pontiac and Kennebec more than 15% of the hatched larval population reached maturity.

COLORADO

San Luis Valley Branch Station-Center, Colorado

J. A. Twomey, R. V. Akeley, R. J. Young

Breeding Program. First-year seedlings were obtained from the breeding programs at Greeley, Fort Collins and Beltsville. Two hundred thirty-four selections were made from approximately 25,000 seedlings grown in 1966. Sixty-four selections were made from the advanced seedling increase.

Twenty-eight advanced seedlings were selected for chip tests. Samples were chipped at harvest, 3 weeks at 70° F. post harvest, 1 and 3 weeks at 70° F. after storage for 12 weeks at 40° F. and after 12 weeks storage at 50° F. All seedlings produced light colored chips at harvest and 3 weeks' storage at 70° F. post harvest, however, chips had extremely poor color at other storage temperatures (Colorado table 1).

USDA Seedling Trial No. 1. Sixteen USDA seedlings, Kennebec and Russet Burbank were included in a yield trial. Total yield and yield of each grade were determined. In addition, specific gravity, chip color and percent reducing sugar were determined.

Twenty-four seed pieces of each selection were planted in two 34-inch rows and replicated 4 times. Spacing in the row was 12 inches. Three hundred fifty pounds of fertilizer (13-39-0) was applied approximately 3-4 inches directly below the seed piece at planting.

Planting date was May 10 and harvest date was September 13.

Yield and specific gravity data may be found in Colorado table 2. Specific gravity was determined by the potato hydrometer method.

Chip color was determined at harvest, three weeks post harvest at 70° F., 1 week and 3 weeks at 70° F. after 12 weeks' storage at 40° F., and 1 week and 3 weeks at 70° F., after 12 weeks' storage at 50° F. (Colorado table 3).

With the exception of B4784-1 and B4829-7, all selections produced chips of acceptable color at harvest. However, only ten selections produced chips of acceptable color with the post harvest storage treatment of 70° F. for three weeks.

The most promising seedlings were B5141-6 and B5042-2. These seedlings produced light colored chips after storage at 40° F. and warming for three weeks at 70° F.

In general, low reducing sugar content was associated with acceptable chip color (Colorado table 4). B5141-6 and B5042-2 were low in reducing sugars regardless of storage treatment.

Seedling Yield Trial No. 2. Fifty advanced seedlings from the breeding program at the Greeley Station were included in a yield trial. Twenty-five hills of each seedling were planted in two 34-inch rows, with 12-inch spacing in the row and replicated 4 times. Fertilizer (13-39-0) was applied 4 inches directly below the seed piece at planting time, at the rate of 295 pounds per acre. Specific gravity, grade percent, and total yield were determined (Colorado table 5).

Variety Yield Trial. Twelve selections were included in the yield trial this year. Each selection was planted in two 30-foot rows, 34 inches apart with 12-inch spacing in the row and replicated 6 times. Fertilizer (13-39-0) was applied 4 inches below the seed piece at planting at the rate of 350 pounds per acre. Planting date was May 10 and harvest date was September 13. Total yield and yield for each grade may be found in Colorado table 6.

La 62-162 repeated as the top yielding selection for the third year. The yield of U.S. No. 2 potatoes was considerably greater this year due to the tendency to produce slightly pointed tubers. The pointed tubers may be the result of water management early in the season. However, its yield, red color, and general quality were sufficiently good that this selection will be tested again.

Red McClure and Kennebec produced large yields of good quality this year, although the Red McClure produced more small potatoes than usual.

Norgold Russet yielded well but produced an exceptionally large percentage of small potatoes. This variety needs more study to determine the management practices required to produce more A size tubers. Norgold Russet is of special interest because of its smooth attractive appearance.

Pennchip performed well this year in both yield and chipping trials. This variety tends to be somewhat rough and lacks the desired uniformity. The ability to produce light colored chips is reason enough to continue testing this variety.

Seedling 46125 continues to perform well in yield and chip trials. This selection has been outstanding in all respects and will possibly be named in 1967.

Colorado seedlings 372, 348, 432 and Louisiana TL6894-R produced satisfactory yields but have other weaknesses which preclude them from further testing.

ND5719-4 is a particularly attractive variety for this area. Yield and quality have been excellent. This seedling has produced light colored chips at harvest but does not perform well after prolonged periods of storage at low temperatures. Testing of this seedling will be discontinued.

Spacing Trial. Five advanced seedlings and Norgold Russet were included in the spacing trial. Each selection was planted at 7 and 14 inches in two 34-inch rows, 30 feet long and replicated 6 times. Fertilizer (13-39-0) was applied 4 inches below the seed piece at planting at the rate of 350 pounds per acre.

The closer spacing produced larger yields, although, the differences were not always significant (Colorado table 7). The amount of tubers under 2 1/8" was significantly greater for the seven inch spacing. The opposite, with the exception of Norgold Russet is true for the yield of tubers over three inches.

C-348 and C-342 produced significantly more U.S. No. 2 potatoes at the closer spacing. ND5719-4 produced significantly more culls at the fourteen inch spacing.

With information from the yield trial, spacing for most of the selections tested should be approximately ten inches. The correct spacing for Norgold Russet is questionable and further testing is necessary.

Potato Chipping Trial. Each year a number of new varieties and seedlings are tested for chipping ability and reducing sugar content. Selection is made for desirable horticultural characteristics before seedlings advance to the laboratory for testing. These seedlings are compared with standard varieties now being used for chips.

This year all selections produced exceptionally light colored chips directly from the field at harvest; this was not the case in 1965. Some darkening occurred with three weeks storage at 70° F., although, all selections produced chips of acceptable color.

The percentage of reducing sugar was closely related to chip color. The chip color and specific gravity data are found in Colorado table 8 and the percentage reducing sugar data are in Colorado table 9.

The selections showing promise as chipping varieties are: Frito-Lay numbers 13, 27, 264, 376 and 311; Colorado seedlings 7630-3 and 63-15-101; and USDA seedling 46125. Pennchip, Russet Rural and Kennebec also performed well.

Colorado table 1. Chip color^{1/} and specific gravity of 28 advanced seedlings from various storage temperatures.

Seedling	Specific Gravity	Harvest Color	3 Wks. at 70° Color	12 Wks at 40°		
				1 Wk. 70° Color	3 Wks. 70° Color	12 Wks. at 50° Color
BR6246	1.085	27	32.0	-	7.0	18.5
BR6255	.082	43	33.0	-	7.5	10.0
BR6272	.096	44	39.0	9.9	20.5	21.5
BR6397	.087	42	41.0	-	16.0	15.5
BR6397	.090	43	41.0	9.0	17.5	18.0
BR6400	.100	46	40.0	-	20.0	18.0
230	.085	37	30.0	-	9.5	20.0
230	.090	43	42.0	10.5	12.0	22.5
G470	.105	41	26.0	6.0	18.0	16.5
G472	.109	42	30.0	12.0	18.0	15.5
G478	.097	38	32.5	10.0	17.0	22.5
G478	.091	39	35.5	9.0	22.0	21.5
G487	.080	27	31.0	9.5	16.0	18.5
G487	.091	37	36.0	9.0	18.5	22.0
G510	.103	45	24.0	10.5	12.0	17.0
G525	.109	45	31.5	11.0	14.5	18.0
G526	.090	34	28.5	5.0	9.0	22.0
G539	.084	38	38.0	10.0	12.5	23.0
G540	.095	35	37.5	17.5	32.5	16.0

continued

Colorado table 1, continued.

F46-31	.081	35	32.5	9.0	16.5	22.0
BR5593-7	.079	44	34.5	6.0	12.0	8.0
G236-33	.087	37	40.5	9.0	14.5	15.0
G362-1	.093	43	38.0	11.0	31.5	19.0
G257-1	.086	40	39.5	7.5	11.0	14.0
G257-11	.080	36	40.5	11.0	20.0	16.5
G404-57	.077	36	31.5	12.0	17.5	11.5
179-12	.079	40	31.5	9.5	21.0	20.5
179-34	.077	32	32.5	9.5	11.0	16.5

¹/ Color readings made on a Photovolt Meter Model No. 610. Readings of 25 or above are considered acceptable.

Colorado table 2. Yield and specific gravity of USDA seedlings at Center, Colorado, 1966.

Seedling	Yield Per Acre				Total Yield	US No. 1 Pct.	Specific Gravity
	US No. 1 21/8"	US No. 2	Culls	B Size 21/8"			
	Cwt.	Cwt.	Cwt.	Cwt.			
B5287-16	257	23	2	11	295	87	1.069
B5253-31	311	18	4	24	359	86	.084
B5299-39	276	36	4	10	328	83	.085
B5415-6	429	37	10	15	492	87	.092
B5282-13	282	36	5	42	366	76	.087
B5422-6	238	65	9	28	341	69	.086
B4784-1	277	240	26	30	573	49	.078
B5301	256	62	7	28	354	72	.079
B5141-6	342	36	2	20	401	85	.108
B5042-2	282	92	7	20	402	70	.096
B5132-3	338	43	21	18	422	79	.079
B5066-3	356	71	10	21	460	77	.076
B5052-7	310	55	8	11	386	80	.084
B5000-18	198	127	1	57	383	52	.080
B4829-7	270	70	2	10	354	76	.075
B5036-40	448	42	13	40	545	82	.095
Russet Burbank	274	65	22	70	432	63	.088
Kennebec	412	91	56	22	583	70	.090
LSD .05	48	38	9	10	45	7	

Colorado table 3. The effect of various storage temperature treatments on chip color¹/of USDA seedlings at Center, Colorado, 1966.

Seedling	Harvest Color	3 Wks at 70°F Color	12 Wks at 40°		12 Wks at 50°	
			1 Wk at 70°F Color	3 Wks at 70°F Color	1 Wk 70°F Color	3 Wks 70°F Color
B5287-16	30	26.5	5.0	21.0	12.0	36.0
B5253-31	34	21.5	8.0	10.0	15.0	16.0
B5299-39	28	16.5	6.0	7.5	12.5	13.0
B5415-6	38	30.5	14.5	13.5	26.0	20.5
B5282-13	42	33.5	10.5	19.0	25.0	28.0

continued

Colorado table 3, continued.

B5422-6	31	23.5	5.5	8.0	19.0	20.0
B4784-1	19	9.0	9.5	8.0	13.0	10.5
B5301-7	36	27.0	7.0	10.0	19.0	20.0
B54141-6	41	35.0	18.5	31.5	34.0	36.0
B5042-2	40	33.5	14.0	29.5	28.0	33.0
B5132-3	37	31.5	5.5	15.0	20.0	30.0
B5066-3	27	16.0	5.5	14.0	15.5	19.0
B5052-7	35	23.5	5.5	9.0	11.0	15.0
B5000-18	31	20.0	6.0	8.0	15.5	14.0
B4829-7	23	19.5	5.5	8.0	10.0	11.0
B5036-40	39	40.0	10.0	-	29.0	34.0
Russet Burbank	36	29.5	13.0	24.5	25.0	30.0
Kennebec	42	34.0	15.0	29.5	27.5	32.5

1/ See footnote 1, table 1.

Colorado table 4. The effect of various storage temperatures on percent reducing sugar.

Seedling	Post Harvest	12 Wks at 40°		12 Wks at 50°	
	3 Wks 70°	1 Wk 70°	3 Wks 70°	1 Wk 70°	3 Wks 70°
	Red.	Red.	Red.	Red.	Red.
	Sugar	Sugar	Sugar	Sugar	Sugar
	Pct.	Pct.	Pct.	Pct.	Pct.
B5287-16	.20	1.24	.90	.50	.17
B5253-31	.18	1.16	.78	.50	.55
B5299-39	.27	1.31	.92	.57	.59
B5415-6	.21	.61	.72	.26	.40
B5282-13	.20	1.58	.55	.27	.29
B5422-6	.23	1.15	.38	.36	.46
B4784-1	.59	.68	.55	.54	.85
B5301-7	.15	1.36	.89	.36	.33
B5141-6	.12	.40	.14	.15	.17
B5042-2	.15	.64	.26	.20	.18
B5132-3	.16	1.18	.53	.34	.28
B5066-3	.14	1.30	.69	.52	.30
B5052-7	.19	1.36	1.01	.51	.46
B5000-18	.21	1.26	.92	.54	.45
B4829-7	.29	1.18	.63	.58	.60
B5036-40	.13	.78	-	.22	.18
Russet Burbank	.18	.61	.38	.23	.24
Kennebec	.14	.52	.32	.22	.25

Colorado table 5. Specific gravity and yield for fifty advanced seedlings.

Seedling	Yield Per Acre					Specific Gravity
	U. S. No.1	U. S. No.2	Culls	B Size	Total	
	Pct.	Pct.	Pct.	Pct.	Cwt.	
B5089-17	59	18.5	17.8	3.8	505	1.105
B5032-18	80	8.7	5.8	4.6	463	.093
B5035-5	93	1.3	4.3	0.6	461	.105
B5516-4	93	0.7	5.3	0.8	434	.086
BT5209-9	74	13.7	8.1	3.7	419	.091
B4987-34	72	7.0	13.4	7.0	395	.089
BT4841-3	60	8.8	17.5	12.9	395	.080
B5052-18	74	0.0	14.9	10.4	394	.075
B5016-4	68	14.4	14.4	2.4	381	.100
B5287-36	82	5.0	12.0	1.0	373	.083
B3960	87	2.0	0.0	10.2	369	.090
B5219-1	79	4.8	11.7	3.9	363	.096
B5090-11	96	1.0	1.0	1.9	361	.082
B5161-15	83	0.0	13.0	3.3	360	.085
B5089-18	89	6.3	0.7	3.5	360	.080
G40-1	88	4.3	5.4	2.1	358	.091
BL4472-1	86	4.6	0.9	8.3	356	.085
B4771-6	81	12.4	3.1	3.1	351	.084
B5052-14	71	13.8	8.5	6.2	343	.083
BT5215-1	85	1.3	8.7	5.0	341	.095
G324-5	96	1.2	1.2	1.3	334	.095
B5263-14	95	4.0	0.0	1.0	329	.085
DT6063-1R	88	0.9	2.8	7.5	327	.092
G126-2	84	7.1	7.1	1.1	323	.091
B4878-7	87	10.5	0.9	0.9	321	.081
BT5215-2	80	6.1	8.8	4.4	315	.094
DT5997-2R	81	4.5	9.1	4.6	312	.092
B5093-1	90	0.0	1.3	7.9	299	.091
B5068-4	84	8.2	0.0	7.3	298	.082
B5036-45	97	0.0	1.3	1.2	296	.084
B4808-19	98	0.0	1.0	1.0	287	.075
B5210-7	89	3.9	3.9	2.9	287	.071
BT5043-2R	71	6.7	11.1	11.1	287	.088
G69-14	92	3.9	1.0	2.9	285	.087
160-365	92	1.3	1.3	5.3	285	.083
B5088-7	77	6.3	12.5	3.7	281	.076
B5232-3R	62	4.6	21.8	11.5	280	.082
B5132-3	97	1.1	0.0	1.1	280	.079
B4987-30	67	1.2	25.9	5.9	279	.083
G69-5	96	1.1	1.1	1.2	275	.091
B5288-60	87	7.0	0.0	5.8	274	.072
BT5404-2	88	0.0	3.8	7.6	265	.089
DT6063-2R	83	5.9	1.5	8.8	261	.078

continued

Colorado table 5, continued.

BT5218-6	84	5.4	5.5	4.3	247	.081
DT6003-1R	87	1.6	9.7	1.6	240	.080
B5023-42	84	1.9	11.3	1.9	235	.080
G321-19	89	5.5	4.1	1.4	228	.083
B5218-7	79	8.5	6.8	5.0	225	.082
B5016-6	87	5.1	2.6	5.1	193	.076
DT5946-1R	41	8.2	47.9	2.8	152	.078
LSD .05					71	

Colorado table 6. Var.Yld.trial. Yield Per Acre

Variety	U.S.No.1 > 21/8"-3">3"		U.S.No.2	Culls	B Size < 21/8"		Total
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	
La62-162	225	125	169	6	35		562
Red McClure ^{1/}	324	49	41	12	65		492
Kennebec	234	157	25	30	42		490
C-372 ^{1/}	301	57	19	7	76		461
Pennchip	294	84	12	10	38		441
46125	234	128	15	8	55		441
C-348 ^{1/}	231	96	27	13	48		417
TL6894-R ^{1/}	241	102	24	7	32		407
C-432 ^{1/}	206	131	13	14	33		399
ND5719-4	155	149	18	21	35		380
Russet Burbank	198	31	24	18	54		327
Norgold	188	27	2	2	96		317
LSD .05	25	24	12	8	10		33

^{1/} Red tubers.

Colorado table 7. The effect of spacing on total yield and grade.

Variety	Spacing	Yield Per Acre					
		U.S. No.1		U.S.No.2	Culls	B Size	
		21/8"-3">3"	>3"			< 21/8"	Total
		Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
46125	7"	232	86	23	16	92	451
"	14"	192	143	15	11	52	415
C-348 ^{1/}	7"	234	85	40	10	73	443
"	14"	168	136	21	6	37	370
C-432 ^{1/}	7"	202	114	29	14	44	404
"	14"	107	206	10	14	24	362
TL6894-R ^{1/}	7"	247	91	27	7	48	421
"	14"	159	164	21	7	30	383
Norgold	7"	165	27	8	2	130	334
"	14"	155	43	6	3	110	318
ND5719-4	7"	205	146	24	15	51	442
"	14"	112	199	20	25	30	389
LSD .05		33	29	12	5	15	46

^{1/} Red tubers.

Colorado table 8. The effect of various storage temperatures on chip color^{1/} of advanced seedlings and established varieties.

Selection	Specific Gravity	Harvest Color	Post Harvest	12 Wks at 40°		Storage	12 Wks at 50°	
			3 Wks 70° Color	1 Wk 70° Color	3 Wks 70° Color		1 Wk 70° Color	3 Wks 70° Color
Frito-Lay 1	1.090	38	34.0	14.0	15.5	16.5	28.0	26.0
" 13	.099	47	38.5	19.5	30.5	31.5	24.0	31.0
" 27	.100	45	43.0	26.5	31.0	23.5	32.5	35.0
" 162	.103	39	36.5	26.5	21.5	32.5	40.0	31.0
" 264	.098	32	33.5	25.0	27.0	19.0	32.0	34.5
" 376	.107	42	37.0	27.0	31.5	33.0	35.0	28.0
" 311	.099	47	37.0	30.5	31.5	34.0	34.0	35.0
7490-2	.069	35	27.5	8.0	9.5	9.5	17.0	18.0
7630-3	.089	41	29.5	15.5	26.5	16.0	30.5	35.0
63-15-101	.101	30	27.0	17.5	35.0	15.5	32.0	36.0
ND5899-1	.089	44	35.0	16.5	22.5	23.0	23.0	27.5
ND5719-4	.090	41	35.0	9.0	10.0	10.0	16.5	19.0
Russet Rural	.096	40	30.0	20.0	29.0	16.0	36.0	31.5
Kennebec	.091	42	40.5	25.0	25.0	15.0	32.0	34.0
Katahdin	.091	40	35.5	8.0	24.5	19.0	23.0	20.0
Pennchip	.088	41	41.0	30.0	36.0	33.0	36.0	34.5
46125	.104	41	40.5	31.5	37.0	32.5	40.5	39.5
47156	.097	40	26.5	12.5	26.5	17.5	29.0	28.0

^{1/} See footnote 1, table 1.

Colorado table 9. The effect of various storage temperatures on the percent reducing sugar in advanced seedlings and established varieties.

Selection	Post Harvest	Reducing Sugar					
		12 Wks at 40°		Storage	12 Wks at 50°		
		3 Wks 70°	1 Wk 70°		1 Wk 70°	3 Wks 70°	
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	
Frito-Lay 1	.13	.48	.35	.30	.23	.28	
" 13	.12	.30	.20	.17	.25	.17	
" 27	.11	.33	.24	.27	.26	.16	
" 162	.10	.30	.36	.15	.11	.25	
" 264	.14	.31	.25	.40	.17	.18	
" 376	.09	.29	.18	.13	.12	.29	
Monona	.09	.26	.20	.15	.12	.19	
7490-2	.19	.95	.58	.51	.31	.54	
7630-3	.13	.65	.37	.48	.29	.24	
63-15-101	.19	.43	.19	.44	.28	.20	
ND5899-1	.11	.45	.30	.23	.23	.25	
ND5719-4	.11	1.10	.58	.63	.19	.59	
Russet Rural	.14	.34	.29	.34	.15	.23	
Kennebec	.09	.22	.36	.44	.38	.16	
Katahdin	.12	1.04	.36	.38	.31	.33	
Pennchip	.11	.26	.20	.13	.17	.19	
46125	.07	.21	.14	.15	.11	.16	
47156	.19	.68	.37	.28	.27	.55	

CONNECTICUT
Arthur Hawkins

Varieties. Potato variety tests were conducted in 1966 on two commercial potato farms in the Connecticut River Valley. The location at Farm G had been in potatoes the previous three years and in corn the previous two years. The location at Farm N had been in Grazer sudan grass in 1965 following potatoes for several years.

Seed was supplied primarily through the cooperation of the USDA National Potato-Breeding Program from Presque Isle, Maine.

Experimental procedures, total yields, yields over 1 7/8", yields over 1 7/8" with seriously off-shaped tubers removed, tuber defects, specific gravity, and chip color are given in Connecticut tables 1 and 2.

Yields. Moisture was especially short in early June, early July, and late August. Irrigation was applied four times at location G and three times at location N.

At Farm G, the highest marketable yields were produced by Kennebec, Katahdin, F5570, B4123-10, and B5132-3. B4132-10 equaled Kennebec in total yield but had 9% under 1 7/8 and 4.5% off-shape. Alaska had a high percentage of small, even at 12" spacing, and 7% off-shape. Norgold produced the lowest yield.

At Farm N with late planting, highest marketable yields were produced by Kennebec, Alaska, B5132-3, and Monona.

Specific Gravity. At both locations, the red skinned seedling B5063-3 had the highest specific gravity. At Farm G, Ona and Kennebec had the next highest specific gravity followed by Katahdin and F5570; Norgold and Monona had the lowest readings. At Farm N, with late planting, Ona, Kennebec, and Katahdin ranked the highest (after very high B5063-3) with Monona the lowest of the named varieties.

Chip Color. In spite of cold storage after harvesting at Farm G., (see footnotes to tables) Monona and Kennebec produced good colored chips. At location N., the lightest colored chips were produced by Monona followed by Kennebec and B5063-3, Katahdin, Alaska, and Superior.

Seedling Selections Tested. Seventeen seedlings which had proven to be superior in preliminary tests in Connecticut or elsewhere were compared in 12-hill lots at Farm G and N, Connecticut tables 3 and 4.

Several of these selections were superior to Katahdin in yielding ability, and one or two slightly better in chip color.

B5011-17, B5090-11, B5422-9, B5422-10, and B4784-1 produced the highest marketable yields of white-skinned tubers at Farm G. The first three were also higher yielding than Katahdin at Farm N. The red-skinned seedling, IL57410-10 produced the highest yield at both locations.

1/
Connecticut table 1. Yield^{1/}, specific gravity, and chip color or potato varieties and seedlings at Farm G., Ellington, Connecticut, 1966^{2/}

Variety of seedling (Spacing 9" except *)	Total Yield Per Acre	Yield Per Acre Over 1 7/8"					
		Free of Serious Offshape ^{4/}		Specific Gravity ^{5/}		Chip ^{6/} Color	
	Cwt.	Pct.	Cwt.	Pct.	Cwt.		
Alaska (12")*	483	86	416	79	384	1.067	8.7
Katahdin	462	94	438	94	436	69	8.0
Kennebec (8")*	490	94	465	90	444	73	6.8
Monona	408	93	381	92	376	58	6.0
Norgold	274	88	243	86	236	62	8.6
Ona (12")*	424	92	394	91	389	74	9.4
Superior	372	95	355	93	349	67	7.8
B4123-10	490	91	446	86	424	66	8.2
B5036-40	405	92	375	91	369	66	7.6
B5063-3 (red)	416	85	357	83	348	83	7.7
B50B33-3	438	95	417	91	401	65	7.7
B5132-3	466	93	437	90	422	64	8.7
F5570 ^o (10")	526	91	481	91	481	69	9.1

o - Two reps only of F5570

- 1/ Plots: 1 row 21 feet long. Replication: 4 in randomized blocks (4 sections x 4 rows) not damaged by spray tracks. Soil: Naragansett f.s. loam pH 5.6, 4th consecutive year to potatoes since corn. Fertilizer: 2500 6-8-8 in row plus sidedress 50 N from urea.
- 2/ Season and conditions: Ellington, 15 miles N.E. of Hartford, Conn. Planted: April 28. Dry and high temperatures especially June and early July. Irrigated four times during the season.
Percent green leaves on 9/13: Ona, 90%; B5063-3 80%; Alaska, 30%; Katahdin and Kennebec, 25%; B5036-40, 10%; Monona, 5%; others 0.
- 3/ Seed: from USDA Presque Isle, Maine except F5570 from PEI, Canada.
Cut-seed 1½ to 2 oz., spaced 9 inches, except Alaska and Ona at 12"; Kennebec at 8"; F5570 at 10".
- 4/ Tuber Observations: Alaska had high % small even at 12" spacing, also 7% off-shape. Kennebec 3% green. Sprouting: following warm storage (see footnote 6) on 1/30/67. Alaska 1/8"; Katahdin 1" vs Norgold 2"-6". See also 7/ below on Tuber shape.
- 5/ Specific Gravity: by weight in air and in water; average of 4 replications (approximately 8-lb. tubers 2½" to 3" in diam. per sample). Specific Gravity 1.080=20.2% dry matter 1.070 = 18.1%; 1.060=16%.
- 6/ Harvested: 10/6/66. (25° on 10/6/66). Farm storage (40°-45°) until graded 11/14/66, then stored at 50°. Specific gravity run 12/23/66. Storage temperature raised to 70° 1/13/67; chipped 1/30/67. Chip color average 2 samples each 10 tubers from two blocks. Proposed Color Reference Standard Proctor and Gamble Co. Chips with readings 6.0 and 7.0 = good; 8.0 = acceptable; higher the reading the darker the chip.
- 7/ Tuber shape: Alaska, Ken. and Monona, some irreg.; Superior, f. good; B4123-10, f.g. some pears, B5036-40, f.g. sl. irreg., B-5063-3, small; B50B33-3: some irreg., growth cracks, knobs; B5132-3, growth cracks.

Connecticut table 2. Yield^{1/}, specific gravity, and chip color of potato varieties and seedlings at Farm N. Windsorville, Connecticut, 1966^{2/}. Late Planted^{2/}

Variety of 3/ seedling (Spacing 9" except *)	Total Yield Per Acre	Yield Per Acre Over 1 7/8"					
		Free of Serious Off-shape ^{4/}				Specific Gravity ^{5/}	Chip Color ^{6/}
	Cwt.	Pct.	Cwt.	Pct.	Cwt.		
Alaska (12")*	381	90	346	88	338	1.066	6.1
Katahdin	324	94	307	93	304	67	6.1
Kennebec (8")	363	95	345	94	342	68	5.5
Monona	331	98	325	97	323	55	5.0
Norgold	316	86	273	84	268	59	8.6
Ona (12")*	338	95	324	94	317	69	7.7
Superior	227	97	222	95	218	57	6.4
B4123-10	330	79	263	79	261	64	8.4
B5036-40	288	91	262	90	261	62	6.0
B5063-3 (Red)	291	70	205	70	205	79	5.8
B50B33-3	327	95	311	94	309	61	6.9
B5132-3	366	94	344	92	340	55	6.8

- 1/ Plots: 1 row 21 feet long. Replication: 3 in randomized blocks (3 sections x 4 rows) not damaged by spray tracks. Soil: Enfield silt loam pH 5.4, first year after Grazer sudan hybrid, previously potatoes 4 years. Fertilizer: 2500 6-8-8 in row plus 30 lbs. N sidedressed. 50 lbs N plow down as cyanamid.
- 2/ Season and conditions: Windsorville, 10 miles N.E. of Hartford, Connecticut. Planted: May 17. Dry and high temperatures especially June and early July. Irrigated 3 times during the season.
- 3/ Seed: from USDA Presque Isle, Maine. Cut-seed 1½ to 2 oz., spaced 9 inches, except Alaska and Ona at 12"; Kennebec at 8".
- 4/ Tuber Observations: Alaska, Norgold, B4123-10, and especially B5063-3 high % small.
- 5/ Specific Gravity by weight in air and in water; average of 3 replications (approximately 8-lb. sample of tubers 2½" to 3" in diam. per sample). Specific Gravity 1.080--20.2% dry matter; 1.070 = 18.1%; 1.060--16%.
- 6/ Harvested 10/7/66 (25° on 10/6/66). Farm storage 40°-45° until graded 11/16/66, then stored at 50°. Specific gravity run 12/23/66. Storage temperature raised to 70° 1/13/67; chipped 1/30/67. Chip color average 2 samples each 10 tubers from two blocks. Proposed color reference standard Proctor and Gamble Company. Chips with readings 6.0 and 7.0 = good; 8.0 = acceptable; higher the reading the darker the chip.

Connecticut table 3. Seedling varieties test (12 hills), Farm G,^{1/} Ellington, Connecticut. 1966. Average of 2 replicates*

Seedlings ^{2/}	Yield		^{3/} Specific Gravity	^{4/} Chip Color	Remarks
	Over 1 7/8"	Off-shape out			
	Cwt.	Pct.			
B3478-45	393	93	1.072	8.3	Round medium
B5011-17	491	95	75	9.6	Round, f. good, sl. russet
B5042-2	340	88	69	5.9	Oval good, some irreg.
B5088-7	396	93	62	8.3	Irreg. round, deep nose
B5089-17	417	88	74	9.6	Oval, some irreg. V. late
B5090-11	495	89	64	8.2	Elip., growth cracks
B5253-31	424	85	65	9.3	Oval irreg.
B5263-2	343 ^{5/}	64 ^{5/}	70	8.4	Discard, irreg. obl.
IL57410-10	490	93	61	8.6	Red, rd., deep-eyed
TL8117	454	88	58	9.9	Oblong, smooth
B4784-1	538	90	65	9.2	Obl. smooth, some pears
B5415-6	442	96	69	6.9	Large round, sl. russet
B5422-6	410	87	64	9.4	Obl., few irreg., smooth
B5422-9	498	93	69	9.0	Small, sl. russet
B5422-10	513	92	64	8.1	Katahdin type, few gr. cr.
B5446-4	370	89	59	9.5	Deep-nose, round
B5459-7	388	80	69	8.4	Growth cracks, pear shape
					(Dis)
Katahdin* (4 reps)	455	96	74	7.9	Good, medium large, smooth

*Average of 2 replicates except Katahdin 4 reps.

^{1/} Twelve hills at 10-inch spacing planted April 28, 1966.

See footnote 1, Connecticut table 1 relative to conditions at Farm G.

^{2/} Seed from USDA Presque Isle, Maine.

^{3/} and ^{4/} See footnotes ^{3/} and ^{4/} as for Connecticut table 1.

^{5/} Total yield 538, but 7% less than 1 7/8, 29% offshape.

Connecticut table 4. Seedling varieties test (12 hills), Farm N, ^{1/}
Windsorville, Connecticut. 1966. Late planted 5/17/66.

Seedlings ^{2/}	Yield		Specific Gravity ^{3/}	Chip Color ^{4/}
	Over 1 7/8"	Off-shape out		
	Cwt.	Pct.		
<u>Average of 2 replicates</u>				
B3478-45	251	92	66	7.9
B5011-17	330	92	67	9.6
B5042-2	240	94	65	6.0
B5088-7	317	92	57	9.3
B5089-17	291	94	70	8.0
B5090-11	335	95	55	8.5
B5253-31	319	92	60	8.0
B5263-2	124	75	62	7.5
IL57410-10 (Red)	484	97	60	8.0
TL8117	286	86	55	9.8
Katahdin*	287	95	69	6.6
<u>Single 12-hill comparison</u>				
B4784-1	254	89	55	8.6
B5415-6	314	95	67	5.8
B5422-6	212	86	61	9.0
B5422-9	384	94	69	7.8
B5422-10	224	86	62	6.0
B5446-4	235	87	51	9.4
B5459-7	339	92	63	8.8
Katahdin	<u>309</u>	<u>95</u>	<u>69</u>	<u>5.8</u>

*Average of 4 reps of Katahdin check

^{1/}Twelve hills at 10-inch spacing planted May 17, 1966.

See footnote 1, Connecticut table 2 relative to conditions at Farm N.

^{2/}Seed from USDA Presque Isle, Maine.

^{3/}and ^{4/} See footnotes ^{3/} and ^{4/} as for table 2.

DELAWARE
Eugene P. Brasher

Twelve seedlings and seven named varieties were tested in 1966. The experimental conditions and procedure were as follows: soil, Norfolk sandy loam; planting date, 4/1/66; plot design, randomized block; replications, four; plot size, 3 by 24 feet; spacing in row, eight inches; fertility, 2000 pounds of 10-10-10 per acre in bands at planting time; irrigation, when soil moisture reached 50% available; fungicide, Zineb; insecticide, Sevin; harvest date, 8/12/66.

Delaware table 1. Yield tests, Delaware Agricultural Substation, Georgetown, Delaware, 1966.

Variety	Yield of U.S. No. 1 Tubers Per Acre		Specific Gravity ^{1/}
	Cwt.	Pct.	
B5132-3	453	94	49
B5088-7	444	91	54
B5267-7	408	92	62
B5282-13	378	91	55
B5299-39	376	90	57
B725-61	371	82	45
B5141-6	362	89	78
B5036-40	362	93	54
Norgold Russet	359	87	52
Delus	352	95	63
B5066-3	352	92	50
Kennebec	346	85	63
B5287-16	345	89	54
B5000-18	324	87	56
Monona	311	93	53
B4829-7	299	88	48
Penobscot	277	89	68
Haig	263	76	54
Katahdin	262	89	63
L. S. D. 5%	61		4

^{1/} 1.0 omitted.

The above results indicate that several seedlings were superior to named varieties. Among those superior in yield were: B5132-3, B5088-7 and B5267-7. In specific gravity, B5141-6 was by far the best seedling or variety in the test.

FLORIDA
E. N. McCubbin

Potato Variety and Seedling Selection Trials at
Hastings, Florida in 1966

Thirteen potato varieties and 13 seedling selections were grown for comparison with Sebago, the standard variety grown in Northeast Florida. Seed stocks were secured mostly from the USDA Potato Breeding Programs at Presque Isle, Maine and Baton Rouge, Louisiana. Seed of one stock was obtained from Wise Potato Chip Company, Berwick, Pennsylvania.

Experimental--Location, Hastings, Florida; soil, Rutledge fine sand; plot size, single rows 40 inches apart and 13 feet long; seed size, 1.5 to 2.0 ounces each; seed spacing, 12 inches in the row; plot design, randomized block; replications, five; planting date, January 25, 1966; fertilizer, 2500 pounds 6-8-8 per acre in a band on each side of the row; fungicide, Maneb; insecticide, parathion; harvest date, May 17, 1966--112 days after planting.

Results--Yields of marketable US 1A potatoes ranged from a high of 284 cwt. per acre from white Huron to a low of 150 cwt. per acre from red Norland. Sebago produced 220.9 cwt. US 1A per acre. Sebago was significantly outyielded at the 5 percent level by white Huron, Ona, LaChipper and by red LaSoda and Catoosa. Sebago was also outyielded significantly by seedlings white B5066-3 and B5063-3. Sebago was outyielded by white Fungo, Reliance, and Emmet as well as by white seedling B5088-7 and red seedling TL8134, but not significantly. Varieties and seedlings yielding less than Sebago, but not significantly less, were white Penobscot, Fundy, Avon, and white seedlings B2894-24, B4829-7, 6HS9, B5141-6, and B5000-18. Potato varieties and seedlings yielding significantly less than Sebago were white Superior, B5036-40, B5052-7 and B4860-5 and red Norland and TL3197.

Florida table 1. Yields of potato varieties and seedling lines at Hastings, Florida in 1966.

Variety or Seedling	Market- able US1A Per Acre Cwt.	Market- able US1B Per Acre Cwt.	Total Market- able US1A and B Per Acre Cwt.	Unmarket- able US1A and B Per Acre Cwt.	Total Yield US1A and B Per Acre Cwt.	Stand Pct.
Huron	284	3.0	287	23	310	98.5
Red LaSoda	274	0.8	275	38	313	100.0
B5063-3	255	4.2	259	55	315	98.5
Ona	253	0.8	254	19	273	96.9
Catoosa	253	0.8	254	12	267	98.5
B5066-3	250	1.6	252	43	295	98.5
LaChipper	249	1.8	251	20	271	100.0
TL8134	246	1.2	247	59	306	98.5
Pungo	237	0.8	237	24	262	100.0
B5088-7	237	3.0	240	42	282	98.5
Reliance	234	1.8	236	14	250	100.0
Emmet	227	1.6	228	39	268	96.9
Sebago	220	2.6	223	34	258	90.8
B2894-24	220	1.8	221	45	266	98.5
B4829-7	216	1.6	218	33	251	96.9
Penobscot	215	0.6	215	11	227	96.9
6HS9	213	1.2	214	50	264	95.3
B5141-6	204	0.6	205	30	235	98.5
B5000-18	201	1.6	203	30	233	96.9
Fundy	195	1.6	196	27	224	98.5
Avon	187	0.6	187	34	221	96.9
TL8197	182	0.6	182	24	207	98.5
Superior	180	1.0	181	13	194	100.0
B5036-40	171	1.8	173	20	193	89.2
B5052-7	167	2.8	170	42	212	90.8
B4860-5	162	7.6	170	32	202	100.0
Norland	150	0.8	151	12	163	98.5
LSD 5%	38	3.1	40	21		
LSD 1%	50	4.1	53	28		

HAWAII
J. A. Crozier

Kennebec is generally the white variety grown when a commercial potato crop is attempted in Hawaii. In 1966, 5 USDA seedlings were compared with the Kennebec variety for their suitability to Hawaiian conditions. The results are given in Hawaii table 1.

Hawaii table 1. Comparison of Kennebec with five selections grown in Hawaii, 1966.

Clone	Yield Per Acre		Ave. No. Tubers Per Plant	Remarks
	Total Cwt.	Marketable Cwt.		
Kennebec	110	98	7.1	Vigorous plants, slightly resistant to late blight
B5141-6	68	60	4.5	Late blight resistant, susceptible to leaf roll
B5036-40	48	40	3.7	Late blight resistant; susceptible to leaf roll and early blight
B5088-7	44	32	3.2	Severe leaf roll
B5090-11	38	24	3.9	Severe leaf roll
B5066-3	-	-	-	Very susceptible to leaf roll and early blight

ICELAND (Reykjavik and Eyrarbakki)
E. I. Siggeirsson

Twelve seedlings and three varieties were grown in southern Iceland for comparison with the commonly grown variety Gullauga.

The growing season was below average with a mean temperature (June-September) of 54° F. in Reykjavik and 52.5° F. at Eyrarbakki. Light night frost (27° F.) occurred on August 16 and 17 in Reykjavik. Killing frost occurred in Reykjavik September 19 and at Eyrarbakki September 22.

The seedlings and varieties were planted in 6-row plots (3 x 12 feet) with an 18-inch seed spacing.

Sea algae (10 tons) plus ammonium nitrate (100 pounds) plus superphosphate (75 pounds) were applied per acre on the infected soil, but on the clean soil ammonium nitrate (368 pounds) plus theophosphate (120 pounds) plus K₂O (360 pounds) per acre were used.

Yields are given in Iceland Table I. ND4122-2, B4557-2, B4537-8, B4494-15 have good yields compared to Gullauga. The seedling Antenima x B4557-2 has good yield and excellent resistance to nematode type A, B, and AxB. Antenima is a German variety resistant to nematode in that country. B4824-1 and B4824-7 have excellent flavor and good cooking qualities, especially those in the clean soil.

All of the test entries were grown on a sandy loam soil heavily infested with the Golden Nematode at Eyrarbakki, but those grown on a muck soil free of nematodes were in Reykjavik.

Iceland table 1. Potato varieties and seedlings tested in Iceland, 1966.

Variety or Seedling	<u>Nematode infected soil</u> (Sandy loam)		<u>Clean Soil (Muck)</u>		<u>Resistance to Golden</u>		
	<u>Total Yield Per Acre</u>		<u>Total Yield Per Acre</u>		<u>Nematode</u>		
	Cwt.		Cwt.		A	Type B	AxB
ND4122-2	79		88		Good	Good	Med.
B4557-2	77		70		Ex.	Ex.	Ex.
B4537-8	75		71		Good	Poor	Med.
B4296-9	67		72		Good	Med.	Poor
B4494-15	63		73		Good	Med.	Poor
B1558-1	60		70		Poor	Med.	Med.
B4824-1	51		88		Good	Good	Med.
B4824-1	49		88		Good	Good	Med.
B4839-2	48		60		Poor	Poor	Poor
Bintje	25		70		Poor	Poor	Poor
Gullauga	19		75		Poor	Poor	Poor
B4159-2	15		20		Poor	Poor	Med.
B4151-7	15		22		Poor	Poor	?
Antenima	63		68		Good	Good	Good
Antenima x B4557-2	65		70		Ex.	Ex.	Ex.

IDAHO (Aberdeen)

W. M. Iritani and J. J. Pavsek

Evaluations in 1966 were conducted at two locations; Aberdeen which is certainly located in the main production area of southeastern Idaho and at Parma, which is representative of climatic conditions of western Idaho.

Seven advanced seedlings from the USDA breeding program at Aberdeen and seven varieties, some of which are new releases, were evaluated at each location. The varieties which had not been tested before are: Hi Plains, Platte and Haig from Nebraska, Chinook (a chipping variety from Canada) and Pioneer, which is a red skinned release from Nebraska.

The plots were all 25 feet long, one row wide, replicated 5 times in a randomized block design. The seed was spaced 10 inches with row spacings of 3 feet. Seed piece size was approximately 2 oz. They were planted at Parma on April 21, at Aberdeen on May 6, 1966. Harvesting at Parma was conducted on September 26 and at Aberdeen on October 4. Both lots were graded on November 20 into the following grades: U.S. No. 1's (2 inch or 4 oz. minimum), 10 oz. and oversize, small size less than 2 inch or 4 oz., and rough tubers which included all knobby, dumbbell, pointed end and otherwise malformed tubers.

Results: The summer temperatures were less than ideal the early part of the season. On June 25, a low of 29° F. was recorded at Aberdeen which injured the tops of many potatoes. A killing frost was not obtained in the fall until quite late, which improved considerably the yield of many fields.

The highest total yields (Idaho table 1) at Parma were obtained with Pioneer at 467 cwt/Acre, W44-3A at 461 cwt/Acre and, surprisingly, Russet Burbank with 401 cwt/Acre. At Aberdeen (Idaho table 2) the highest total yields were considerably lower with A483-17 at 252 cwt/Acre and W44-3A and Hi Plains at approximately 250 cwt/Acre. Specific gravities were considerably above normal at both locations. The lowest specific gravity was obtained with Haig on both trials. The fry color ratings which gives some indication of processing quality showed Norgold to be the poorest for processing. Seedling A483-17 also produced relatively dark french fries. Observations of scab after harvest showed Penobscot with the most lesions of surface scab and Pioneer had the severest pit scab. Seedlings A598-3, A483-17 and Norgold had no scab lesions. The other varieties had small amounts of scab.

Idaho table 1. Variety evaluation trial, Parma, 1966.

Variety	Yield Per Acre					Specific Gravity	Fry Color Rating ^{1/}
	10 oz.						
	Total	No. 1's	Over	Rough	Small		
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.		
A598-101	388	260	63	90	37	1.099	2.5
A598-3	344	222	84	96	24	1.091	2.3
A483-6	369	208	42	135	35	1.092	2.3
A483-17	388	261	106	100	27	1.094	2.8
W44-3A	461	373	101	22	65	1.113	2.0
Alaska Russet	277	180	16	18	80	1.091	2.0
A589-65	362	295	51	18	62	1.107	2.5
Hi Plains	358	287	45	27	45	1.091	2.0
Platte	341	282	22	5	47	1.095	2.0
Russet Burbank	401	255	59	106	39	1.095	2.5
Haig	285	184	9	4	97	1.083	2.5
Norgold	346	254	46	7	86	1.089	3.2
Pioneer	467	367	124	38	53	1.086	1.5
A589-43	393	244	72	112	37	1.092	2.5
LSD .05	99	65	41	79	18	.009	
LSD .01	NS	87	55	105	25	.012	

^{1/} According to USDA color standards for french fries.

Idaho table 2. Variety evaluation trial, Aberdeen, 1966.

Variety	Yield Per Acre					Specific Gravity	Early Dying ^{1/}	Fry Color Rating ^{2/}
	Total	No. 1's	10 oz.					
			Over	Rough	Small			
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.		Pct.	
A598-101	230	181	32	23	25	1.092	38	2.3
A598-3	241	206	77	25	10	1.091	5	2.3
A483-6	223	178	41	30	28	1.093	40	2.3
A483-17	252	215	87	25	12	1.100	5	3.0
W44-3A	249	205	26	1	43	1.100	37	2.7
Penobscot	204	147	5	2	54	1.100	33	2.5
A589-65	242	193	24	4	45	1.106	4	2.5
Hi Plains	250	196	23	2	45	1.094	77	2.5
Chinook	190	129	3	10	51	1.087	100	2.7
Russet Burbank	239	177	36	33	30	1.090	54	2.7
Haig	202	134	7	2	67	1.086	79	2.5
Norgold	197	142	11	2	46	1.096	100	3.5
Pioneer	238	208	59	10	20	1.092	96	2.3
A589-43	237	177	43	39	21	1.088	45	2.3
LSD .05	28	33	17	12	15	.008	13	
LSD .01	37	44	22	17	21	.010	17	

^{1/} Readings taken September 1, 1966.

^{2/} According to USDA color standards for french fries.

INDIANA
H. T. Erickson

A. Selection for dry matter.

The specific gravity of Indiana-grown potatoes is frequently low, and this is especially true of those grown on organic soils. Organic soils have an advantage to the potato breeder insofar as they permit a more rigorous selection for a number of characters. Ordinarily scab, hollow heart, second growth and growth cracks are more severe in clones having a tendency to show these defects, when they are grown on organic soil.

The purpose of this study is to show the specific gravity relationship between the field-grown "seedling" generation produced on organic soil, and the subsequent clonal generation grown on a mineral (sandy loam) soil.

First Clonal Generation

Seedling generation	S. G.	Range	
<u>S. G. Range</u>	<u>1.050-70</u>	<u>1.071-90</u>	
1.050-70	39	44	= 83
1.071-90	4	13	= 17
	43	57	

The above table shows the percentage of clones in each specific gravity range for the two seasons. There was a much higher percentage in the upper range in the first clonal generation, which reflects seasonal and soil differences in addition to experimental error in sampling and measuring. The average for all clones in the seedling generation was 1.066 and for the first clonal generation 1.071.

Of the 83% at or below 1.070 as seedlings 54% were over this figure the following year. Among the original 17% over 1.070 a total of 75% were subsequently in this category. On the basis of these data one should expect a 40% better chance of selecting for high dry matter in the first clonal generation among the higher ranking seedlings than among those below 1.070.

The correlation coefficient was calculated for the two years and found to be $r=.45$ which is significant at the 1% level.

B. Protein studies.

Food Technology is cooperating in the analysis of clones for crude and extractable protein. Of 50 clones studied thus far the crude protein ranged from 8.3 - 15.1% on a dry matter basis while extractable protein was more variable, showing a 2.2 - 8.2% range. Studies on protein inheritance are being continued using selected clones as parents.

C. Potato seed germination.

Studies on the effects of light, temperature and gibberellin on potato seed germination are being continued. Some results have been published and other manuscripts are in preparation.

By the use of gibberellin and controlled environment excellent germination can be had in recently harvested seed, which ordinarily exhibits considerable dormancy. This information is being used in the breeding program to reduce the time from seed harvest to planting. This is especially useful in genetic and cytological studies.

D. Variety Trials.

The North Central Trial results are reported elsewhere. One other trial was planted, at Vincennes on sandy loam, where a new potato industry is developing.

<u>Variety</u>	<u>Specific Gravity</u>	<u>Yield</u>
Red Pontiac	1.057	293
Norgold Russet	1.061	240
Kennebec	1.070	239
Norland	1.060	237
Superior	1.069	234
Cobbler	1.072	216
Haig	1.070	187
Russet Sebago	1.060	163

Although not highest either in yield or dry matter Superior continues to be the leading variety in the area. It is earlier than Kennebec, and earliness is of prime importance. It shows good scab resistance, which, together with a better shape makes it better than Cobbler. Others in a comparable yield range have undesirably low dry matter.

Haig is still highly regarded but appears more sensitive to water stress, which is probably the reason for its low yield in this trial.

E. General Breeding.

Two hundred thirty-four seedlings were selected in the summer of 1965. These were tuber indexed for virus, and further selected for tuber characters during the winter. A total of 178 were planted. In this first clonal generation, of 5-hill plots, 38 (21%) were saved for further study. Progenies from B6219 and B6303 were particularly interesting.

No seedlings were planted in the field during the year. Forty-eight crosses were made and about 10,000 seedlings grown in the greenhouse for planting in the field next season.

IOWA

J. L. Weigle and L. E. Peterson

The red-skinned variety Chieftain has been released jointly by the Iowa Experiment Station and the U.S. Department of Agriculture. This variety has been tested in many sections of the country under the seedling number Ia 57410-10 and in the North Central Regional Trial as Ia 57410. It appears to be particularly well adapted to the northern part of the North Central Region. A detailed description will be published in the American Potato Journal.

The breeding program is being carried out at Muscatine at present. The soil is a sand and it is subject to extremely high soil temperature during the growing season. In relation to this, many otherwise acceptable selections have had to be discarded because of susceptibility to heat necrosis. At present, one advanced selection looks promising and is being increased for further testing.

KOREA

Chung Il, Choi and Kim Kang Kwun

Variety Trials

The trials were conducted with 49 varieties on the experiment farm at Tae Kwan Lyong, Korea in order to select new economic varieties of high yield and good quality.

The best six (in 1965 trials) of 26 advanced selections from Potato Investigations, USDA were included in these trials. The remaining twenty selections have been maintained for further selection and/or breeding. The other 43 varieties included in this trial were 8 from I.V.R.O., Netherlands; and 35 from the USA, Japan, and West Germany.

The following cultivation practices were carried out: Date of planting was May 14 and date of harvest was September 27; fifty-five hills were replicated 4 times in a simple lattice design with a seed spacing of 10 inches and a row spacing of 30 inches; 1000 pounds of 14-18-14 fertilizer and 8800 pounds of compost per acre were applied at planting time; Sevin for lady beetle control and Dithane M-45, for late blight control, were sprayed at weekly intervals soon after emergence. The results are tabulated in Korea table 1.

Korea table 1. Yield, specific gravity, and late blight reaction of newly introduced potato varieties, Alpine Experiment Station, Kangwon-do, Korea, 1966.

Varieties	Source	Yield Per Acre		Specific Gravity ^{3/}	Late Blight Reaction August 15 ^{4/}
		Available ^{1/}	Total ^{2/}		
		Cwt.	Cwt.		
<u>Early Maturing</u>					
Irish Cobbler	USA	151	193	1.079	3
Ostara	Netherlands	226	250	73	1
B5066-3	USA	219	244	63	1
Norland	USA	161	221	87	3
Tawa	USA	169	198	81	1
B5132-3	USA	196	216	103	1
Red Warba	USA	158	171	80	2
Pungo	USA	158	171	76	2
Earlaine	USA	136	169	70	1
Nordak	USA	131	151	105	3
Warba	USA	113	144	103	3
Early Gem	USA	123	135	70	2
Wheeler	Japan	115	133	95	1
Snowflake	USA	102	132	121	2
Norgleam	USA	97	122	84	3
Pawnee	USA	74	93	67	3
Red Bake	USA	24	51	87	3
<u>Midseason</u>					
B5090-11	USA	274	318	87	1
Cherokee	USA	256	294	79	2
Sientje	Netherlands	197	283	85	0
Extase	Netherlands	144	250	114	1

continued

Korea table 1, continued

3603-10	USA	217	231	91	2
Plymouth	USA	199	227	119	1
Benimaru	Japan	155	195	79	1
B5088-26	USA	115	136	55	1
Kennebec	USA	104	127	104	0
Chippewa	USA	93	115	68	1
May Queen	Japan	14	29	63	1

Late Maturing

Patrones	Netherlands	188	376	102	0
Multa	Netherlands	229	375	81	0
Spartaan	Netherlands	280	372	85	0
Arka	Netherlands	280	356	77	0
Essex	USA	265	288	83	2
Rodosa	Netherlands	227	281	128	1
Concordia	Germany	199	266	116	0
Antze	Germany	169	265	83	0
Delos	Germany	134	246	82	0
Katahdin	USA	212	252	87	1
Cosima	Germany	199	232	73	0
Sieglinde	Germany	184	228	88	0
Hessen Krone	Germany	168	227	72	1
B5089-17	USA	167	222	80	0
Saco	USA	193	220	62	0
Merrimack	USA	154	175	154	0
Calrose	USA	129	171	88	0
Pontiac	USA	137	154	65	1
Norin No. 1	Japan	124	150	87	0
B4987-24	USA	107	145	90	1
Russet Burbank	USA	95	121	87	1
LSD at 0.05 level		91		20	

1/ Rotted, sunburned, and small tubers of less than 50 gr. are not included.

2/ Total yields include small tubers but not those sunburned or rotted.

3/ Specific gravity was measured by the "weight in air and water" method from samples of 10 tubers per plot.

4/ Late blight infection was estimated at seven weekly intervals beginning August 3.

Scale: 0 - no late blight lesions.

1 - no blight apparent from 6 feet but on closer examination one to several lesions observed.

2 - blight obvious but less than 50% defoliation.

3 - more than 50% defoliation.

4 - dead.

LOUISIANA

James F. Fontenot, B. W. Wascom, D. W. Newsom, R. J. Constantin
C. F. Balerdi, W. L. Hawthorne, and F. J. Dainello

Weather conditions in the spring of 1966 were very poor and it was impossible to prepare the land at Ben Hur until early March and potato planting was delayed until March 8, 1966. Past research has shown that spring potatoes should be planted from January 15 to February 15 for best results.

Our objectives under this project are essentially the same as stated in the report submitted last year. In order to accomplish these objectives, we feel it is imperative that we grow the seedling generation in the greenhouse at Baton Rouge and all clonal generations in the North (Rhineland, Wisconsin). The entire lot from each selected seedling is thus taken to Rhineland, Wisconsin for field planting in May. Whereas, approximately 4 pounds from each first-year clone selected in the North is left for further increase and the remainder shipped to Louisiana for testing under our conditions.

Breeding Behavior of Certain Characters in Potato Progenies. One of the main problems of the potato breeder is the inability to effect selection in an efficient manner in the early generations.

Research was undertaken to evaluate the performance of the progenies studied in the seedling (greenhouse) and the first clonal (field) generation using selected and unselected seedlings in 1964 but only selected seedlings in 1965. In 1964, nine families totaling 653 selected and unselected seedlings were grown in the seedling generation at Baton Rouge, Louisiana in the greenhouse and in the first clonal generation at Rhineland, Wisconsin. In 1965, the study included 601 selected seedlings from 34 families observed in both generations.

Stoloniferousness, depth of set (greening), tuber color, tuber shape, and yield were observed in both the seedling and the first clonal generation, while plant maturity and vigor were observed only in the first clonal generation.

The association between stoloniferousness in the greenhouse and stoloniferousness in the field was moderate when selected seedlings were used. There was no association between depth of set in the greenhouse and depth of set in the field. Tuber color in the seedling generation was found to be highly associated with tuber color in the field. There was a moderate association for shape of tubers between both generations, particularly when selected seedlings were used. Yield in the greenhouse was not correlated with yield in the field. Wide ranges were observed between the r values of the nine progenies studied for most of the characters.

A moderately high association was obtained between stoloniferousness and the number of tubers in the greenhouse. Fairly high to moderate r values were obtained in the field between numerous stolons and good vigor or late maturity, good yield and good vigor, and late maturity and good vigor. Moderate values were obtained between good yield in the greenhouse and good vigor in the field.

Only 2.3 percent of the seedlings that were selected in the seedling generation were reselected in the first clonal generation.

In general, selection for color was most reliable. Selection for tuber shape and stoloniferousness was less reliable and still less reliable for depth of set and yield.

Yield Test at Baton Rouge. Of the 1000 seedlings selected in the greenhouse, 117 were considered worthy of further testing.

Research data collected to date on our advanced lines suggested that one clone selected in 1961, two in 1962, three in 1963, nine in 1964, and forty in 1965 were outstanding in many horticultural characters.

Yield data are presented in Louisiana tables 1, 2, and 3 and the results reflect the extremely poor weather conditions of 1966. The superior performance of 31-19 and 42-225 at Baton Rouge was certainly very encouraging.

Notes on North Dakota clones grown in Louisiana are presented in Louisiana tables 6 and 7. Results obtained in 1966 indicated that the superior clones were ND1-102, ND2-19, ND5782-1R, ND3-106, ND6223-3R, and ND6509-7R.

Yield Tests at Other Locations. (Louisiana table 5) The best clones in yield at the Plaquemines Parish Experiment Station were Red LaSoda, LaRouge, LaChipper and 11-150.

Outstanding lines at New Roads were LaChipper, 21-37, 31-19, and 31-22.

The superior clones tested in Lafourche Parish were LaRouge, LaChipper, Rushmore, 31-27, 21-203, and 41-189.

Dr. H. L. Hammett from Mississippi State University tested some of our advanced lines along with many varieties and reported that 22-112 produced 322.7 cwt. per acre which was the highest in the trial. He also reported that 22-111 produced tubers that were classified as outstanding in type.

Red LaSoda, LaRouge, and 22-112 were high in yield at Calhoun, Louisiana.

Culinary Studies

Chipping. All advanced lines were chipped after two months storage at 60 degrees F. Clones that were rated excellent in chipping ability were 11-40, 11-150, 31-105, 41-103, 41-173, 41-182, 41-195, 41-298, 41-316, LaChipper, Superior, and Katahdin. Lines that rated good to fair in chipping quality were 11-66, 21-10, 31-19, 31-22, 31-103, 41-30, 41-241, 41-246, 42-278, and Rushmore.

Regional trial entries plus all advanced clones were stored at 40 degrees F. for two months and then chipped without any reconditioning. Only Neb.202.57-1 looked good in this study.

French Frying. All clones that were screened for French frying ability were pre-cooked for 3 minutes and then frozen. One month later the potatoes were fried when frozen for 6 minutes and then rated as to color and texture. Clones that were rated superior in French frying were: 41-30, 41-50, 21-20, and 12-4. Clones found to be good in French frying were: 31-19, 21-180, 11-150, LaChipper, and 42-115.

After-Cooking Darkening. The entire group of 1965 clones were classed as to their after-cooking darkening trait. Lines that showed the least after-cooking darkening were 51-39, 51-41, 51-50, 51-102, 51-120, 51-128, 51-138, 52-161, 51-172, and 51-189.

Scab and Blight Studies

Another study was conducted to improve our technique in screening potato lines for scab resistance.

Three greenhouse methods of inoculation were compared with a field planting known to be infested with scab inducing organisms. Clones 11-150, 22-112, 21-203, 11-66, and 31-147 had consistent resistance to scab under all methods of inoculation.

High significant correlation coefficients were obtained for the relationship between pustule type and percent tuber surface area covered.

The most severe pustule type infection was obtained whereby the organism was cultured on agar and then mixed with the vermiculite.

The field method has proven to be erratic in the past.

On the basis of results obtained, a combination of greenhouse method two (seed pieces were planted in bedding media and inoculated by applying a homogenate of scabby tubers to the tops and sides of the rows. This treatment was repeated for four consecutive weeks and again 60 days following the fifth inoculation), and greenhouse method three (the bedding media was inoculated by thoroughly mixing pure cultures of S. scabies before planting the seed pieces) could possibly produce more severe infection.

The following clones showed high resistance to late blight 21-26, 31-103, 41-34, 41-182, and 41-297. Clones that were classified as moderately resistant to late blight were 21-37, 31-55, 41-30, 41-298, and 41-316.

Louisiana table 1. Performance of advanced clones at Baton Rouge.

Clones	Parentage	Vigor	Specific Gravity ^{2/} Louisiana	Yield Per Acre	
				U.S.#1	Total
				Cwt.	Cwt.
Red LaSoda	Triumph x Kat. (mutant)	4.0	60	32	51
LaRouge	02-5 (x)	4.0	60	75	98
LaChipper	Gr. Mt. x Cayuga	3.0	63	53	89
Cobbler	Unknown	3.5		76	116
11-40	91-143 x Katahdin	2.5	60	21	25
Katahdin	40568 x 24642	3.0	58	30	54
Superior	AG 29	2.5	63	40	62
12-4	1859 x Red LaSoda	3.0	59	82	115
11-150	B3692-4 (x)	2.0	59	43	58
Rushmore	Gr. Mt. x Katahdin	3.0	61	33	55
Red LaRouge	--	4.0	58	91	119

^{1/} 1 = weak; 5 = very vigorous

^{2/} 1.0 omitted from specific gravity readings

Louisiana table 2. Performance of 1962 and 1963 clones at Baton Rouge.

Clones	Parentage	1/ Vigor	Specific Gravity ^{2/} Louisiana	Yield Per Acre		Remarks
				U.S.#1	Total	
				Cwt.	Cwt.	
21-10	Cobbler x Katahdin	3	62	16	25	Good stand
21-20	Early Gem x Katahdin	3	58	14	17	Good stand
21-26	Early Gem x 91-28	1	63	7	8	Very poor stand
21-37	LaChipper x Katahdin	3	60	16	25	Very poor stand
21-60	61-125 x Katahdin	2		2	2	Very poor stand
21-85	White Rose x 91-28	1		1	2	Very poor stand
22-111	6894 x LaChipper	2	58	43	63	Good stand
22-112	62-162 x Katahdin	3	58	24	31	Good stand
22-128	92-95 (x)	1		1	5	Very poor stand
21-180	Early Gem x 91-28	2	63	26	35	Good stand
21-203	AG 233 (x)	3	63	20	36	Fair stand
31-19	Cobbler x Katahdin	3	63	91	109	Good stand
31-22	Cobbler x Katahdin	3	66	25	44	Good stand
31-55	LaChipper x 11-64	1		1	2	Very poor stand
31-74	11-62 x Katahdin	3	63	10	14	Very poor stand
31-103	91-143 x 11-64	4	64	16	25	Very poor stand
31-105	91-143 x 11-64	4	62	24	44	Good stand
31-147	Early Gem x Katahdin	2		1	1	Very poor stand
31-155	Early Gem x 11-64	2		1	2	Very poor stand

1/ 1 = weak; 5 = very vigorous.

2/ See footnote 2, table 1.

Louisiana table 3. Performance of 1964 clones in Louisiana and Wisconsin.

Seedling	Parentage	Yield		Specific Gravity				1/		Rest Period
		Per Acre		Louisiana		Wisconsin		La.		
		U.S.#1	Total	1966	1965	1965	1965	Vigor	La.	
		Cwt.	Cwt.							
41-2	Early Gem x 11-64	17	38	60	--	78	2.0	4.0	Short	
41-30	Cobbler x 11-64	32	50	66	--	86	2.0	3.0		
41-34	Early Gem x 11-64	1	2	-	--	71	-	4.5	Short	
42-43	Red LaSoda x 12-8	49	85	58	60	73	4.0	4.0	Medium	
41-50	Early Gem x 1859	46	70	59	59	80	4.0	5.0	Short	
41-103	Early Gem x Katahdin	28	55	65	60	83	4.0	4.0	Short	
41-108	Early Gem x Katahdin	22	34	58	61	73	2.0	3.5	Short	
42-115	Red LaSoda x 12-8	42	66	58	60	69	3.0	5.0	Medium	
41-173	1859 x 7935	27	37	65	61	68	2.5	3.0		
41-182	11-170 x 1859	38	56	59	60	74	3.5	3.5	Short	
41-188	Cobbler x 1859	37	66	58	60	83	3.0	3.0	Very short	
41-189	Cobbler x 1859	42	88	58	59	80	3.0	3.5	Medium	
41-195	LaChipper x Katahdin	40	64	65	61	85	3.0	3.0	Very long	
41-196	LaChipper x Katahdin	30	44	58	58	70	2.5	2.7		
42-225	22-227 x 7935	85	132	60	62	76	3.5	3.0		
41-240	91-143 x 11-64	13	13	-	61	86	2.5	5.0		
41-241	91-143 x 11-64	40	67	62	68	80	3.0	3.5		
41-246	LaChipper x 11-64	44	64	61	65	76	2.5	4.0		
42-276	11-64 x 7935	65	90	59	60	65	3.5	3.0		
42-278	11-170 x 21-44	13	30	67	63	85	4.0	5.0		
41-296	Early Gem x Katahdin	41	69	59	61	69	1.5	3.0		
41-297	Early Gem x Katahdin	15	31	64	58	74	2.5	3.5		
41-298	Early Gem x Katahdin	72	100	59	66	83	2.75	2.7		
41-316	11-170 x 1859	64	90	68	74	89	3.25	3.0		

1/ See footnote 2, table 1.

Louisiana table 4. Specific gravity of 1965 clones grown at Rhinelander, Wisconsin.

Clones	Parentage	Specific ^{1/} Gravity		Clones	Parentage	Specific ^{1/} Gravity	
51-2	Early Gem x Katahdin	80		51-136	Chippewa x 11-64	79	
51-10	Cobbler x 11-64	75		51-137	Chippewa x 11-64	68	
51-18	Cobbler x 11-64	90		51-138	Chippewa x 11-64	79	
51-21	11-64 x 8191-52B	75		51-143	11-7 x 11-64	72	
51-25	11-66 x 8191-52B	74		52-149	12-142 x 12-8	67	
51-35	Early Gem x 8191-52B	76		52-153	12-2 x 12-8	75	
51-41	Chippewa x 11-64	66		52-154	12-2 x 12-8	72	
51-51	Chippewa x 8191-52B	68		51-157	1859 x 8240	71	
51-59	11-64 x 11-170	86		51-158	1859 x 8240	78	
52-62	7935 x 8240	65		51-168	11-150 x 8191-15B	63	
52-71	1859 x 7935	75		51-170	11-150 x 8191-15B	59	
51-72	LaChipper x Katahdin	68		51-172	11-150 x 8191-15B	75	
51-73	LaChipper x 8191-52B	87		51-176	11-150 x 8191-15B	75	
51-80	LaChipper x 8191-52B	73		51-180	8117 x 11-64	76	
51-84	11-7 x 11-64	73		51-185	11-150 x 8191-52B	82	
51-102	Cobbler x 11-64	70		51-190	11-150 x 8191-52B	72	
51-113	Ac. 26351 x 11-64	82		51-218	8117 x 11-170	67	
51-118	11-150 x 11-64	74		51-222	Fingerling x 11-170	75	
51-124	Ac. 26351 x Ac. 26440	94		52-224	22-234 x 22-230	65	
51-128	11-64 x 8191-15B	71		51-225	Ac. 26440 x 11-64	90	

^{1/} See footnote 2, table 1.

Louisiana table 5. Yield of potato clones from several Louisiana locations, 1966.

Clones	New Roads ^{1/} Yield Per Acre		Plaquemines Parish ^{2/} Yield Per Acre		Lafourche Parish ^{3/} Yield Per Acre	
	US#1	Total	US#1	Total	US#1	Total
	Cwt	Cwt	Cwt	Cwt	Cwt	Cwt
Red LaSoda	70	102	93	132	72	91
LaRouge	52	77	106	132	131	152
LaChipper	97	132	105	131	175	198
Rushmore	70	90	50	68	103	133
11-40	27	40	-	-	-	-
11-150	27	35	85	116	103	122
21-20	36	45	-	-	-	-
21-26	44	55	54	66	47	54
21-37	95	133	38	54	105	131
21-60	75	109	12	20	15	18
21-85	3	5	-	-	-	-
21-180	34	48	65	80	77	91
21-203	65	101	56	80	102	135
22-111	15	20	72	90	-	-
22-112	19	36	52	89	77	157
22-173	46	81	-	-	-	-
22-230	5	10	-	-	-	-
31-19	96	116	-	-	-	-
31-22	87	116	-	-	-	-
31-55	9	12	-	-	-	-

continued

Louisiana table 5, continued.

31-103	39	44	-	-	-	-
31-105	42	56	-	-	-	-
31-147	17	22	-	-	-	-
31-155	1	2	-	-	-	-
41-189	-	-	-	-	133	176
LSD .05	40	54	28	32	29	30
.01	53	72	30	43	39	41

1/ Date Planted: 3/2/66; date harvested: 6/13/66.

2/ Date Planted: 3/3/66; date harvested: 6/2/66.

3/ Date Planted: 3/8/66; date harvested: 6/10/66.

Louisiana table 6. Notes on North Dakota clones grown in Louisiana, 1966.

Clones	Specific Gravity ^{1/} at Harvest	Storage Notes on 12/1/66
ND9-51	60	Fair red color, soft, medium sprouts
ND3-46	59	Good white color, firm, long sprouts
ND7-45	70	Poor red color, firm short sprouts
ND2-7	58	Good wh. color, firm, med. sprouts, many rots
ND3-106 ^{2/}	58	Good white color, firm, med. sprouts
ND2-44	61	Fair white color, soft, long sprouts
ND8-50	58	Faded red color, firm, med. sprouts
ND3-12	58	Good white color, firm, short sprouts
ND4-28	58	Fair white color, firm, no sprouts
ND9-100	60	Poor red color, soft, med. sprouts
ND9-6	50	Faded red color, firm, med. sprouts
ND9-42	59	Faded red color, firm, med. sprouts
ND2-19 ^{3/}	59	Fair wh. color, firm, very short sprouts
ND3-105	58	Good white color, fairly firm, long sprouts
ND1-102 ^{4/}	59	Very good white color, firm, med. sprouts
ND8-58	59	Poor red color, soft, short sprouts
ND6660-3R	-	Poor red color, firm, short sprouts
ND5778-2R	61	Good red color, fairly firm, long sprouts
ND5899-1	68	Good white color, fairly firm, long sprouts
ND6064-3R	60	Very poor red color, soft, long sprouts
ND6452-7R	71	Fair red color, firm, short sprouts
ND4524-4R	58	Good red color, fairly firm, short sprouts
ND6212-1R	-	Poor red color, firm, no sprouts
ND5782-1R ^{3/}	58	Outstanding red color, firm, med. sprouts
ND6223-3R ^{2/}	58	Very good red color, very firm, short sprouts
ND6509-7R ^{2/}	64	Good red color, very firm, no sprouts
ND6660-3R	-	Poor red color, firm, short sprouts
Norland	58	Poor red color, fairly firm, very long sprouts
LaChipper	63	Very good white color, firm, med. sprouts

1/ See footnote 2, table 1.

2/ Good.

3/ Very good.

4/ Outstanding.

Louisiana table 7. North Dakota clones grown in Louisiana, 1966^{1/}

Clones	Yield Per Acre		Vigor	Remarks
	U.S.#1's	Total		
	Cwt.	Cwt.		
ND4-28	84	138	3.0	
ND3-46	57	118	2.5	
ND9-6	99	178	3.0	One of best plant types
ND2-44	46	94	2.0	Poor stand
ND3-105	58	124	3.0	Fair plant type
ND9-100	7	31	2.0	Very poor stand
ND1-102	111	178	3.5	Good plant type
ND9-42	67	180	3.0	Late
ND9-51	83	124	2.0	
ND7-45	52	98	2.5	Poor stand, single stem plants
ND2-7	78	117	3.5	
ND8-50	70	121	6.0	Late, skin color poor
ND2-19	87	164	3.5	
ND3-106	117	187	4.0	Very good plant type
ND8-58	12	50	4.0	
ND3-12	63	133	3.0	Very good plant type
6215-1R	14	21	2.5	Poor stand
6223-3R	73	101	3.0	
6452-7R	51	81	4.0	Late
6509-7R	82	107	5.5	Late, many flowers
6660-3R	17	30	2.0	Poor stand
5782-1R	57	99	4.0	
6064-3R	49	75	4.0	

^{1/} Planted 3/8/66; harvested 6/7/66.

MAINE

Hugh J. Murphy, Robert V. Akeley, Michael J. Goven

Cooperative variety trials were conducted during 1966 at Presque Isle, Fort Fairfield, and Corinna, Maine. Weather at planting was ideal for rapid germination and emergence. Although July and early August were dry in Central Aroostook County, sufficient moisture was available in Central Maine for near normal yields. Harvest season was dry at all locations with no major frosts.

At Fort Fairfield and Corinna, 31 varieties were tested, whereas the Presque Isle test had 32 entries. At all locations plots consisted of single rows in randomized blocks, replicated six times. Planting dates, harvesting dates, fertilization, and seed piece spacings for the various locations are presented in Maine table 5 of this report.

Yields and specific gravities for the various varieties at all locations are presented in Maine table 1. In general yields were slightly higher in Presque Isle and Fort Fairfield in 1966 than for comparable varieties grown in both 1965 and 1964. Yields at Corinna were almost triple in 1966 for comparable varieties grown in 1965 because of a much better moisture situation during July and August.

Maine table 1. Yield and specific gravity of potato varieties grown at three locations in Maine, 1966.

Variety	Presque Isle		Fort Fairfield		Corinna	
	Yield Per Acre	Specific Gravity	Yield Per Acre	Specific Gravity	Yield Per Acre	Specific Gravity
	Cwt.		Cwt.			
Alaska 114	424	1.091	408	1.083	435	1.068
Bintje	390	1.087	402	1.085	413	1.073
Cobblers	348	1.093	363	1.077	304	1.073
Grand Falls	419	1.100	435	1.087	399	1.077
Hunter	332	1.100	344	1.082	318	1.072
Katahdin	367	1.090	440	1.084	397	1.068
Kennebec	403	1.094	404	1.085	436	1.071
Keswick	410	1.095	392	1.080	353	1.072
Monona	342	1.085	306	1.072	262	1.063
Pennchip	376	1.087	392	1.079	419	1.066
Reliance	384	1.085	417	1.071	392	1.063
Russet Burbank	373	1.092	361	1.082	410	1.079
Shoshoni	399	1.083	434	1.076	498	1.068
B4744-23	262	1.090	274	1.075	224	1.074
B4829-7	380	1.082	381	1.066	285	1.061
B4845-4	385	1.091	402	1.078	397	1.069
B4846-2	332	1.093	316	1.082	309	1.075
B4846-14	386	1.105	429	1.101	393	1.083
B4986-15	328	1.092	276	1.064	246	1.071
B5000-18	351	1.081	326	1.067	260	1.064
B5036-40	426	1.089	410	1.080	376	1.065
B5052-7	360	1.082	297	1.064	216	1.059

continued

Maine table 1, continued.

B5066-3	415	1.081	409	1.069	280	1.062
B5088-7	401	1.080	365	1.065	252	1.057
B5090-11	389	1.086	360	1.073	323	1.060
B5132-3	384	1.080	348	1.070	350	1.061
B5141-6	278	1.107	286	1.099	292	1.087
B5253-31	348	1.084	318	1.064	292	1.064
B5287-16	370	1.076	-	-	-	-
B5299-39	340	1.090	399	1.075	416	1.069
B5301-7	351	1.081	322	1.067	251	1.066
RD 45	366	1.095	394	1.086	375	1.072
L. S. D. (0.05)	32	0.004	39	0.005	34	0.003
(0.01)	48	0.005	48	0.006	45	0.004

Specific gravities at Presque Isle and Fort Fairfield were very high in 1966. For comparable varieties they were almost as high as experienced in Maine during 1960. Specific gravities at Corinna were lower than either of the other two Maine locations in 1966 due primarily to more rainfall during the critical period of late August.

Results of the tuber size measurements by size class are presented in Maine table 2. Worthy of note are Alaska 114, B4744-23, B4846-2, B4846-14 and B5301-7 which produced low percentages of size A or 2½ to 4 inch size tubers. This means a fresh pack would probably lack appearance as small sizes tend to distract from eye appeal.

Maine table 2. Percentage of yield between 1-7/8 and 4 inches in diameter for varieties grown at 3 locations in Maine, 1966.

Variety	Presque Isle		Fort Fairfield		Corinna	
	Class	Class	Class	Class	Class	Class
	1-7/8 to 4 inches	2-1/4 to 4 inches	1-7/8 to 4 inches	2-1/4 to 4 inches	1-7/8 to 4 inches	2½ to 4 inches
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Alaska	92	54	93	56	96	75
Bintje	53 (4 to 10 oz.)		69 (4 to 10 oz.)		64 (4 to 10 oz.)	
Cobbler	96	75	97	77	96	78
Grand Falls	96	81	98	87	97	88
Hunter	98	84	98	85	96	83
Katahdin	97	86	96	90	96	89
Kennebec	96	87	97	87	96	89
Keswick	92	88	93	87	97	90
Monona	97	82	98	85	96	80
Pennchip	97	79	97	85	96	82
Reliance	96	80	96	80	93	84
Russet Burbank	60 (4 to 10 oz.)		70 (4 to 10 oz.)		49 (4 to 10 oz.)	
Shoshoni	97	91	97	89	85	83
B4744-23	93	65	94	58	94	70
B4829-7	95	90	98	90	94	86
B4845-4	97	84	98	88	96	87
B4846-2	96	71	95	57	97	81

continued

Maine table 2, continued.

B4846-14	92	60	95	69	95	72
B4986-15	97	84	98	84	97	84
B5000-18	97	81	97	77	96	79
B5036-40	96	88	97	86	96	85
B5052-7	97	87	98	81	96	80
B5066-3	96	80	98	83	96	80
B5088-7	92	78	95	78	96	79
B5090-11	96	85	97	82	96	84
B5132-3	95	76	96	75	96	83
B5141-6	94	63	96	66	97	78
B5253-31	97	82	97	77	97	80
B5287-16	96	84	-	-	-	-
B5297-39	97	81	97	91	94	87
B5301-7	98	75	98	76	97	80
RD 43	97	81	98	84	97	85

Results of the first chipping and french fry tests are presented in Maine tables 3 and 4. Chip colors were exceptionally good in 1966 with only an occasional variety unacceptable for chips. Monona, RD 45, and Pennchip were very light in color and only B5052-7 and B5088-7 were consistently dark in color at all locations. Of the 32 varieties tested for french fry texture, only Pennchip was considered unacceptable and this characteristic has been evident with Pennchip in all three years that it has been in Maine tests.

For more detailed information regarding the 1966 variety trials in Maine consult the annual Maine-New Hampshire-Vermont Potato Variety Trial bulletin 644.

Maine table 3. Chip color indices for potato varieties grown at three locations in Maine, 1966^{1/}

Variety	Presque Isle	Fort Fairfield	Corinna
Alaska 114	7.3	8.9	8.1
Bintje	6.2	7.0	6.5
Cobbler	6.1	8.1	6.7
Grand Falls	4.2	6.5	5.6
Hunter	7.4	8.8	8.0
Katahdin	6.0	7.7	7.3
Kennebec	3.5	7.4	7.1
Keswick	7.2	8.4	7.1
Monona	3.0	5.4	3.5
Pennchip	3.9	5.2	5.7
Reliance	7.1	9.2	8.0
Russet Burbank	7.0	7.7	7.7
Shoshoni	7.8	8.9	9.8
B4744-23	5.2	7.1	5.6
B4829-7	7.9	9.6	8.0
B4845-4	5.4	8.2	8.0
B4846-2	5.5	7.2	7.1
B4846-14	6.5	7.4	7.3

continued

Maine table 3, continued.

B4986-15	5.6	7.9	6.6
B5000-18	7.7	9.9	8.4
B5036-40	4.9	6.7	6.1
B5052-7	9.1	10.0	8.4
B5066-3	7.7	9.7	7.3
B5088-7	9.1	9.6	9.1
B5090-11	5.5	7.2	7.2
B5132-3	7.1	7.8	7.0
B5141-6	3.1	5.4	5.0
B5253-31	7.4	8.9	7.5
B5287-16	7.8	-	-
B5299-39	7.3	9.3	8.3
B5301-7	6.5	8.6	5.1
RD 45	4.0	5.7	5.7
L.S.D. (0.05)	0.9	0.8	0.8
(0.01)	1.2	1.0	1.0

1/ Chips with lower index numbers are lighter in color.

Maine table 4. French fry color and texture indices for potato varieties grown at Presque Isle, Maine, 1966. 1/

Variety	Color Index	Texture Index
Alaska 114	6.8	1.1
Bintje	5.1	1.0
Cobbler	6.2	1.0
Grand Falls	4.3	1.0
Hunter	6.8	1.0
Katahdin	6.3	1.0
Kennebec	4.5	1.0
Keswick	6.5	1.0
Monona	3.7	1.0
Pennchip	4.0	1.6
Reliance	6.3	1.0
Russet Burbank	6.5	1.1
Shoshoni	6.9	1.0
B4744-23	6.7	1.0
B4829-7	6.7	1.0
B4845-4	6.0	1.0
B4846-2	6.0	1.0
B4846-14	5.6	1.0
B4986-15	5.7	1.0
B5000-18	7.1	1.0
B5036-40	4.9	1.0
B5052-7	7.3	1.0
B5066-3	6.9	1.0
B5088-7	7.9	1.0
B5090-11	4.9	1.0
B5132-3	6.4	1.2
B5141-6	4.7	1.0
B5253-31	6.1	1.0

continued

Maine table 4, continued

B5287-16	6.7	1.1
B5299-39	6.9	1.1
B5301-7	5.3	1.1
RD 45	3.9	1.0
L.S.D. (0.05)	0.8	0.2
(0.01)	1.0	0.3

1/ French fries with lower index numbers are lighter in color and lower texture indices indicate mealier texture.

Maine table 5. Pertinent information about Maine Cooperative Potato Variety Trials, 1966.

	Presque Isle	Fort Fairfield	Corinna
<u>Planted:</u>	May 12	May 14	May 23
<u>Killed:</u>			
Early varieties	Sept. 8	Aug. 22	Aug. 30
Medium varieties	Sept. 8	Sept. 1	Sept. 9
Late varieties	Sept. 8	Sept. 12	Sept. 19
<u>Harvested:</u>			
Early varieties	Sept. 19	Sept. 1	Sept. 9
Medium varieties	Sept. 19	Sept. 12	Sept. 19
Late varieties	Sept. 19	Sept. 22	Oct. 3
<u>Fertilization:</u>			
(Pounds per acre)	120-180-180	120-120-120	160-160-160
Seed piece spacing	<u>1/</u>	<u>1/</u>	<u>1/</u>

1/ Seed pieces of Bintje and Russet Burbank were spaced 16 inches apart. All others spaced 8 inches apart.

MAINE

Donald Merriam, F. E. Manzer, and R. V. Akeley

Ring Rot Resistant Seedlings

1965

The results of these annual tests, as previously indicated, are reported one year behind in order that tubers of selections appearing disease-free or questionable in the field can be checked after a storage period of five or six months. As in the 1964 tests, only selections shown in previous plantings to have commercial promise were inoculated in 1965. New introductions totaling 181 yielded nine which showed no evidence of infection and ten which had a low incidence of infection (Maine table 6). Reinoculation of 163 selections showing evidence of resistance in previous tests yielded ten which showed no evidence of infection and ten which had a low incidence of infection (Maine table 7).

Maine table 6. Advanced selections showing resistance in first year, five-hill, ring rot inoculation tests^{1/}--1965.

Pedigree		^{2/}	^{2/}
Number	Parentage	Vine symptoms	Tuber symptoms
B5590-1	B607-56 x B3692-4	1/5 ?	19/29
B5598-8	B607-56 x Norland	0/5	1/45
B5600-1	B3139-24 x Cherokee	0/5	0/23
B5600-6	B3139-24 x Cherokee	0/5	0/32
B5601-11	B4088-4 x Katahdin	0/5	12/22
B5613-1	Katahdin x Merrimack	1/5	7/20
B5632-1	Ac 26134 x Merrimack	1/5 ?	0/27
B5632-6	Ac 26134 x Merrimack	0/5	0/35
B5635-13	B355-35 x Onaway	2/5 ?	0/24
B5643-2	B3692-4 x B3556-12	0/5	1/21
B5647-7	B3876-25 x B4482-26	0/5	0/33
B5668-4	A596-1 x B3692-4	0/5	0/32
B5685-1	B3696-13 x B5239-3G	1/5 ?	4/39
B5685-4	B3696-13 x B5239-3G	0/5	0/25
B5696-7	B4523-8 x Katahdin	0/5	14/28
B5735-4	B607-56 x B4488-3	1/5	7/32
B5735-5	B607-56 x B4488-3	1/5	8/33
B5737-6	B936-12 x B4488-3	0/5	0/25
B1678-5	B922-3 Selfed	0/5	6/32
Katahdin checks (37 five-hill lots)		168/185	-

^{1/} A total of 181 selections were tested.

^{2/} Fractions indicate number infected/number examined.

Maine table 7. Advanced selections showing ring rot resistance in five-hill reinoculations tests^{1/}--1965.

<u>Pedigree</u>		<u>2/</u>	<u>2/</u>
<u>Number</u>	<u>Parentage</u>	<u>Vine symptoms</u>	<u>Tuber symptoms</u>
B4829-7	B3139-24 x B3478-45	0/5	0/26
B5000-18	B3114-6 x B3478-45	1/5 ?	0/25
B5052-7	Boone x B3692-4	0/5	0/21
B5304-42	B4157-1 x B4116-2	0/5	4/28
B5401-9	Katahdin x B4116-2	0/5	15/31
B5422-9	B929-23 x B3692-4	2/5 ?	8/25
B5429-6	B2834-3 x B3139-24	0/5	2/24
B4799-7	Ac 26031 x B3478-45	0/5	1/36
B4809-5	B922-3 x B3478-45	1/5	4/23
B4828-11	B3139-24 x B2368-4	0/5	1/37
B4829-3	B3139-24 x B3478-45	0/5	0/38
B4878-7	B3139-24 x B3556-12	0/5	0/25
B1590-2	B3139-24 Selfed	0/5	0/30
B4987-28	B47156 x B3139-24	0/5	2/23
B5001-12	B3139-24 x B2834-3	1/5 ?	0/36
B5012-18	B3556-12 x B3478-45	0/5	0/35
B5091-2	B607-56 x Redskin	1/3	4/18
B5304-17	B4157-1 x B4116-2	0/5	0/13
B1643-2	Teton Selfed	0/5	0/37
B1646-3	B3692-4 Selfed	0/2	2/12
Katahdin checks (32 five-hill lots)		158/160	--

^{1/} A total of 163 selections were tested.

^{2/} Fractions indicate number infected/number examined.

Spindle Tuber Resistant Seedlings Inoculated 1965, Read in 1966
D. C. Merriam, F. E. Manzer and R. V. Akeley

Annual progress summaries of this program are, as previously reported, delayed one year because of the necessity of replanting inoculated seedlings to obtain disease readings.

A total of 325 selections from 194 crosses were mechanically inoculated with PSTV in 1965 using the top switching method. Of these 12 were read as healthy in 1966 and are listed in Maine table 10.

Maine table 10. Advanced selections showing no symptoms of PSTV infection after inoculation in 1965.

<u>Pedigree</u>	<u>Parentage</u>
B5415-1	X1276-185 x B4116-2
B5429-1	B2834-3 x B3139-24
B5645-1	B3725-1 x Penobscot
B5671-1	B922-3 x B3139-24
B5673-1	B922-6 x Katahdin
B5677-1	B936-12 x B4523-8
B5685-1	B3696-13 x B5239-3G
B5699-1	B4523-8 x B3139-24
B5700-1	B4523-8 x B3692-4
B5701-1	B4523-8 x B3696-13
B5718-1	Ac26159 x Katahdin
B1665-1	B2068-23 Selfed

MAINE

Geddes W. Simpson, Franklin E. Manzer
Donald Merriam and Robert V. Akeley

Leafroll Resistant Seedlings

In 1966, 46 selections from Chapman and 4 named varieties were infested with viruliferous green peach aphids in late June. Readings were made in late July and again in August to determine the presence of current season leafroll. The seedlings were planted in groups of 5 hills replicated 4 times. Green Mountains, Katahdins and Mohawk were used as checks and all but a single hill of Katahdin (out of 20) showed current season symptoms of leafroll in August. Most of the seedlings showed current season leafroll. Those not 100 percent infected are listed in table 8. The one selection not showing any current season leafroll is starred. Six selections from previous tests were reinoculated in 1966. The results are shown in table 9.

Maine table 8. Selections from Chapman in 1966 not showing complete infection with leafroll following inoculation with viruliferous green peach aphids in June 1966.

Pedigree	Parentage	Not showing primary leafroll during the summer
B5031-18	B4116-1 x B4154-2	0/20*
B5042-2	B24-78 x Aduns	6/20
B5089-18	B606-3 x B3692-4	2/20
B5236-8	B3941-11 x B3139-24	3/20
B5253-31	B4144-5 x B4116-2	19/20
B5267-2	B3095-18 x B4116-2	15/20
B5287-16	B4523-8 x B4116-2	5/20
B5299-39	B3570-2 x B4116-2	19/20
B5400-8	Houma x B4116-2	19/20
B5415-6	X1276-185 x B4116-2	17/20
B5415-13	X1276-185 x B4116-2	8/20
B5448-3	B3725-1 x (X96-56)	8/20
B5448-6	B3725-1 x (X96-56)	18/20
B5459-1	B4158-5 x B4116-2	2/20
B5459-7	B4158-5 x B4116-2	3/20

Maine table 9. 1965 selections reinoculated in 1966.

Pedigree	Parentage	Not showing current season leafroll in 1966
B5299-39	B3570-2 x B4116-2	10/10
B5400-8	Houma x B4116-2	8/10
B5252-31	B4144-5 x B4116-2	7/10
B5743-2	B3563-2 x F52-4	6/10
B5304-17	B4157-1 x B4116-2	5/10
B5031-18	B4116-1 x B4154-2	0/10

MARYLAND (Eastern Shore)
W. W. Anderson and R. V. Akeley

Twelve white-skinned varieties and seedlings in 50- or 25-pound samples were planted in single-hill rows on three farms (Maryland table 1). These lots were grown under normal cultural practices. Irrigation was used only on the Lankford Farm.

Actual yields were not taken but observations on overall tuber appearance and yielding ability were recorded. Specific gravity ratings were made on the selections from each location soon after harvest.

Twenty-tuber samples from all locations were sliced at harvesttime to check on hollow heart. No hollow heart was observed from the selections grown on the Outten Brothers or the Lankford Farm and only B5088-7 showed a trace of hollow heart on the Matthews Farm. Other pertinent data are presented in Maryland table 1.

Maryland table 1. Potato trials, Pocomoke City, Maryland, 1966.

Seedling or Variety	F A R M L O C A T I O N S													
	App. Yield Sprout Spg*				App. Yield Sprout Spg*				App. Yield Sprout Mat. Spg*					
B5000-18	3	M	S	51	3+	M	O	65	2	M	M	E	65	
Pungo	2+	M	H	53	3-	M	H	69	2	M	VH	M	70	
Katahdin	3+	M	H	53	3	M	S	52	3	M	M	L		
Kennebec	3	M	S	53	3	H	M	66						
B4829-7	4+	H	S	51	4+	VH	none	59	4+	H	none	E	53	
B5088-7	4	MH	H	56	4	H	none	65	4	H	M	E	61	
B5066-3	4++	VH	none	50	4+	H	none	64	4+	H	S	E	67	
B5132-3	4	H	H	50	4+	H	none	69	4	M	none	M	59	
Pungo (local seed)	2+	VL	M	59										
B5141-6	3+	M	MH	86	3	M	M	84	3+	H	M	L	88	
Norgold Rus.	4	M	S	53	3	M	H	67						
Plymouth	3+	H	S	50										
Plt. 4/1/66 Harv. 7/27/66					Harv. 7/27/66 Non-irrigated 1500# of 8-10-12/A at plt. and 500 plowed down Order of Pref. Rating 1 B4829-7 2 B5066-3 3 B5132-3 4 B5141-6					Harv. 8/23/66 Irrig-2X Harv. 8/23 2000# fert/A Order of Rank 1 B4829-7 2 B5066-3 3 B5141-6 4 B5132-3				
Explanation of Symbols: General Appearance: 1, poor; 2, fair; 3, medium; 4, good; 5, excellent Yield-Sprout: S=slight, M=moderate H = high														

* 1.0 omitted from all specific gravity ratings.

MICHIGAN

N. R. Thompson and R. W. Chase

Rainfall during the past growing season at the Lake City Experiment Station was much below normal. Irrigation was required immediately after planting and was continued at weekly intervals until mid-September. Yields of all plots were below expectations.

The 1966 crop terminated potato research at the Lake City Station. A new 80 acre site has been acquired in Montcalm County where potato production and processing are concentrated. To keep pace with the dynamic potato expansion in the State all research programs have been revised and directed to the tablestock, seed, and processing markets. In anticipation of this change, some research was located on the Christensen farm in the Montcalm area.

In the breeding program the number of crosses was increased and seed accumulated to supply 50,000 first-year segregating selections a year. Much of this material is the 6th and 7th backcross from S. tuberosum x S. stoloniferum hybrids. In 1966, in addition to the 10,000 greenhouse produced tubers, 20,000 transplants were set in the field.

Seven advanced seedling clones selected by the Variety Evaluation Committee in 1965 were planted in a yield trial for August harvest (Michigan table 1).

Michigan table 1. Seedling yield trial^{1/}

Variety	Yield Per Acre			Specific Gravity ^{2/}
	Total	No. 1	No. 1	
	Cwt.	Cwt.	Pct.	
MS 506-3	396	332	84	76
MS 710-4	360	317	88	92
MS 709-9	344	334	97	99
MS 503-18	324	308	95	80
MS 425-2	309	287	93	79
Emmet	277	238	86	77
MS 709-1	252	232	92	88
MS 711-4	252	212	84	75
Superior	232	206	89	85
Arenac	200	174	87	87

^{1/} Harvested August 25.

^{2/} 1.0 omitted from specific gravity values.

The main objective of the 1966 variety trial was a more comprehensive evaluation of the so-called "early" varieties. An attempt was made to be more specific in determining the "marketable maturity" of several of the newer varieties. Frequently varieties are tagged with the terms of "early," "medium-early," "medium" and etc. which are broad terms that do not really reflect the actual "marketable maturity."

The varieties evaluated in the 1966 trials are all classed as early or medium-early. The varieties tested were Norland, LaChipper, Onaway, Superior, 425-2L, Norgold Russet, Snowflake, and Arenac. The Norland and Onaway varieties were considered as standards.

Michigan table 2. Variety trial--yield and specific gravity averaged over several locations.

Variety	Yield Per Acre			Specific ^{1/} Gravity
	Total	No. 1	No. 1	
	Cwt.	Cwt.	Pct.	
Norland	295	249	84	59
Onaway	293	279	95	59
LaChipper	277	252	91	62
Superior	236	219	93	64
MS 425-2L	221	192	87	68
Norgold Russet	212	171	81	61
Snowflake	208	178	86	62
Arenac	202	170	84	73

^{1/} 1.0 omitted from specific gravity values.

Michigan table 3. Variety trial--yield and specific gravity at two harvest dates^{1/}

Variety	Harvested Aug. 2, 1966			Sp.Gr.	Harvested Aug. 24, 1966		
	Total	Yield Per Acre	No. 1		Total	Yield Per Acre	No. 1
	Cwt.	Pct.			Cwt.	Pct.	
Norland	338	90	- 60	417	93	60	
Onaway	262	92	- 60	365	96	60	
Superior	236	90	63	364	95	70	
LaChipper	188	80	- 60	361	90	64	
MS 425-2L	265	85	66	316	90	72	
Norgold Russet	237	85	63	321	88	64	
Snowflake	185	85	- 60	309	90	68	
Arenac	189	73	75	280	89	78	

^{1/} Planted May 17, 1966.

^{2/} Size basis only. U.S. No. 1 consists of all tubers larger than 1 7/8 inches.

^{3/} 1.0 omitted from specific gravity values.

Based on data in Michigan table 3, the Norland variety appears to have the earliest marketable maturity. Onaway, MS 425-2L, Superior, and Norgold Russet are intermediate and LaChipper, Snowflake, and Arenac are somewhat later.

Variety Observations:

Norland--consistently good yields.

Onaway--good yields at all locations except on the organic soils. Although vines may show vigorous growth at harvest, it does have the capability of early marketable maturity.

LaChipper--above average yields but not as early as Onaway, Norland, or Superior; a deep-eyed variety; oversized tubers tend to be rough.

Superior--as reported before, the yields with this variety have been variable. It does, however, produce a high percentage of smooth marketable tubers.

MS 425-2L--a Michigan seedling which has been in the trials before. It has an early marketable maturity; however, it is very susceptible to hollow heart and because of this it will not be released as a variety.

Norgold Russet--yields have been about average. At one location without irrigation off-shaped tubers were observed. Generally though, the tubers are very smooth, shallow eyed, and acceptable in appearance. Hollow heart appears to be the main weakness of this variety.

Snowflake--this variety has not performed well in Michigan variety trials. Its yields have generally been below average and it has exhibited a tendency to produce growth cracked and off-shaped tubers.

MINNESOTA

Orrin C. Turnquist, Florian I. Lauer, Carl J. Eide,
Edward B. Radcliffe, Terry Sekioka and Douglas Campbell

Potato Variety Demonstrations

This report consists primarily of 3 sections: (1) A general summary of materials tested in the potato breeding project, (2) a summary of variety trials at several Minnesota locations, and (3) a comprehensive survey by Edward Radcliffe on insect resistance in tuber-bearing Solanums from the Inter-Regional Potato Collection.

About 20,000 new seedlings were grown in the field at Grand Rapids and 11,680 year-old seedlings were grown at Crookston. Horticultural evaluations were made of 119 parents, 23 inbreds, 700 interspecific hybrids, 465 new selections, 330 semi-advanced selections, and 65 advanced selections and varieties. About 900 clones were included in tests for resistance to common scab at Grand Rapids, and 850 clones were tested for field resistance to late blight at Rosemount. Specific gravity determinations were made for 440 clones, and chipping quality tests were conducted on 170 clones. Increase was obtained of 220 clones at Embarrass. All maintenance stocks were indexed for viruses--about 200 clones were indexed in Florida; 8400 tubers were indexed in St. Paul.

Potato variety demonstrations were conducted at seven locations in 1966. In the Red River Valley, plots were planted at Baker, Alvarado, and Crookston. Other plots were located at Fosston, Hollandale, Osseo, and Morris. These trials are conducted in cooperation with commercial growers, county agricultural agents, branch experiment stations, and the Minnesota Department of Agriculture. The purpose of the demonstrations is to familiarize the grower with new varieties and to assist him in evaluating the varieties for use in his area.

Each demonstration had twenty varieties that were planted in 20-hill rows replicated twice. Not all of the varieties tested were included at each location. At harvest the potatoes from the entire plot were weighed and graded for size. Samples were taken for specific gravity and chipping. The performance of the varieties is reported in Minnesota tables 1, 2, 3, 4, 5, 6, 7, and 8. The results of the chipping test out of cold storage and after reconditioning will be reported when the work is completed this winter.

Minnesota table 1. Average potato variety performance for three locations in the Red River Valley, 1966.

Variety	Yield Per Acre		1/ Specific Gravity
	Total	U.S.No.1	
	Cwt.	Pct.	
Kennebec	342	96	84
Irish Cobbler	324	96	83
Bounty	320	94	80
Red Pontiac	314	96	79
Chieftain	314	93	76
Anoka	284	97	80
Norland	281	97	72
Viking	281	98	78
Minn 101	270	97	77

continued

Minnesota table 1, continued.

Platte	268	92	73
Minn 140	262	85	94
Minn 102	257	96	84
Minn 201	253	94	71
Pennchip	247	93	66
Hi-Plains ^{2/}	244	94	79
Hunter ^{3/}	237	94	85
Norgold	230	89	70
Katahdin	222	96	79
Minn 154	217	88	67
Superior	206	97	82
Minn 157	186	96	72
Average	265	94	78

^{1/} 1.0 omitted from specific gravity values. ^{2/} Average of Crookston only.

^{3/} Average of Baker and Alvarado only.

Minnesota table 2. Potato variety demonstration planting, Baker, Minnesota, 1966^{1/}

Variety	Yield Per Acre		Specific Gravity ^{2/}	Variety	Yield Per Acre		Specific Gravity ^{2/}
	Total	US No.1			Total	US No.1	
	Cwt.	Pct.			Cwt.	Pct.	
Kennebec	347	97	81	Minn 140	264	85	91
Anoka	322	97	79	Minn 102	263	98	87
Bounty	320	95	81	Katahdin	261	98	81
Chieftain	219	93	74	Norland	253	98	67
Platte	316	94	81	Norgold	252	85	74
Irish Cobbler	311	97	81	Minn 154	246	94	69
Minn 101	283	97	84	Superior	235	98	81
Viking	279	98	81	Pennchip	225	93	70
Minn 201	272	97	80	Hunter	207	92	86
Red Pontiac	269	97	69	Minn 157	160	97	63
Average	270	95	78				

^{1/} Cooperators: Grower: Frank Thompson, Baker, Minnesota
County Agricultural Agent, Ozzie Daellenbach, Clay County,
Moorhead, Minnesota

Planted: May 18, 1966 Fertilizer: With planter 300 lbs.
Harvested: September 16, 1966 10-20-20
Spacing: Row 38" Hills 12" Sidedressed 40 lbs.
nitrogen

^{2/} See footnote 1, table 1. Disyston applied in fertilizer

Minnesota table 3. Potato variety demonstration planting, Alvarado, Minnesota, 1966 ^{1/}

Variety	Yield Per Acre		Specific Gravity ^{2/}	Variety	Yield Per Acre		Specific Gravity ^{2/}
	Total	US No.1			Total	US No.1	
	Cwt.	Pct.			Cwt.	Pct.	
Red Pontiac	385	98	72	Bounty	318	96	80
Kennebec	337	96	85	Norland	315	97	80
Irish Cobbler	333	94	86	Chieftain	303	97	77
Viking	330	98	80	Platte	287	93	73
Anoka	329	96	85	Minn 101	287	95	77

continued

Minnesota table 3, continued.

Minn 140	276	83	103	Katahdin	245	95	82
Hunter	267	95	84	Minn 201	244	92	72
Minn 102	263	95	81	Norgold	240	92	68
Minn 157	253	97	77	Minn 154	202	85	71
Pennchip	247	92	70	Superior	146	98	85
Average	280	94	79				

1/ Cooperators: Grower: M. O. Sands, Alvarado, Minnesota
County Agricultural Agent, Charles Nelson, Marshall County,
Warren

Planted: June 2, 1966
Harvested: September 22, 1966
Spacing: Row 38" Hills 12"
Vines killed with chemical: September 6, 1966
Fertilizer: With planter 300 lbs. 11-34-0

2/ See footnote 1, table 1.

Minnesota table 4. Potato variety demonstration planting, Crookston, Minnesota 1966 ^{1/}

Variety	Yield Per Acre		Specific Gravity ^{2/}	Variety	Yield Per Acre		Specific Gravity ^{2/}
	Total	US No.1			Total	US No.1	
	Cwt.	Pct.	85		Cwt.	Pct.	
Kennebec	341	96	80	Norland	276	95	69
Irish Cobbler	329	97	79	Pennchip	270	94	57
Bounty	322	91	76	Minn 140	246	87	89
Chieftain	321	89	66	Minn 102	245	95	83
Red Pontiac	288	94	69	Hi-Plains	244	94	79
Minn 201	243	94	62	Platte	202	89	66
Minn 101	241	98	71	Anoka	201	97	75
Superior	237	96	81	Norgold	198	91	68
Viking	235	98	72	Katahdin	160	94	74
Minn 154	204	84	60	Minn 157	144	95	75
Average	247	93	1.073				

1/ Cooperators: Grower: B. C. Beresford, Northwest Experiment Station,
Crookston, Minnesota

Planted: May 18, 1966
Harvested: September 14, 1966
Spacing: Row 40", Hills 12"
Fertilizer: With planter 200 lb. 15-30-15

2/ See footnote 1, table 1.

Minnesota table 5. Potato variety demonstration planting, Fosston, Minnesota, 1966 ^{1/}

Variety	Yield Per Acre		Specific Gravity ^{2/}	Variety	Yield Per Acre		Specific Gravity ^{2/}
	Total	US No.1			Total	US No.1	
	Cwt.	Pct.			Cwt.	Pct.	
Kennebec	444	56	86	Anoka	375	82	77
Chieftain	424	93	76	Bounty	358	75	81
Shoshoni	378	80	80	Minn 102	346	64	76
Viking	377	64	80	Platte	333	78	73
Irish Cobbler	377	51	80	Pennchip	329	33	71

continued

Insect Resistance in Tuber-Bearing Solanums
from the Inter-Regional Potato Collection

This report gives data on resistance in an extensive sampling of IR-1 Solanum stocks to two aphid species, the green peach aphid (Myzus persicae) and the potato aphid (Macrosiphum euphorbiae); and the potato leafhopper (Empoasca fabae). This is a continuation of the study initiated in 1965 and reported by Radcliffe and Lauer (1966).^{1/}

The methods and sampling procedures followed were similar to those described by Radcliffe and Lauer (1966).^{1/} Data are presented (Minnesota table 9) only for those entries represented in all 4 replicates of the experiment. The data were obtained by closely examining each plant for 30 seconds. One to four plants were sampled, depending on how many were available, from each replicate. Replicate means were calculated for each insect species. The progeny means were obtained by averaging the replicate means, and the species means by averaging the progeny means.

The introductions screened in 1966 included an extensive sampling of S. tuberosum L. plus many of the introductions which had shown evidence of aphid resistance in the 1965 trials.

Aphid populations in the 1966 experimental plots were at an even lower density than in 1965. Despite this fact, and although the introductions screened in 1966 represented the entries within each species that had been judged the most resistant in the 1965 trials, there still was a high correlation in rank between the species means of the two years' data.

The greatest level of resistance to green peach aphid has been observed in introductions of S. stenophyllidium, S. trifidum, S. brachisto-trichum, S. sanitae-rosae, and S. bulbocastanum.

Potato aphid resistance is less clear cut in our experiments than is green peach aphid resistance. Among the more resistant species appear to be S. hjertingii, S. brachycarpum, S. multidissectum, S. polytrichon, and S. stoloniferum. In the 1965 experiments S. bulbocastanum appeared relatively resistant.

The potato leafhopper data showed a good statistical segregation of the introductions with respect to resistance only in 1966. The greatest leafhopper resistance was found in S. polyadenium, S. kurtzianum, S. pinnatissectum, S. polytrichon, and S. demissum. In the above discussion I have disregarded species which have been represented by only a few introductions in our trials.

It is evident from these and other studies that considerable resistance to each of these pest species is available within the wild Solanums. If these characteristics could be incorporated into a single variety it would be resistant to three of the most serious insect pests of potatoes.

^{1/}Radcliffe, E. B. and F. I. Lauer. 1966. Aphid Resistance in the Tuber-Bearing Solanum (Rourn.) L. Species. Univ. of Minn. Agr. Exp. Sta. Tech. Bull. 253.

Minnesota table 5, continued.

Superior	319	86	79	Minn 154	256	44	67
Russet Burbank	319	49	79	Norland	252	82	66
Early Gem	288	43	67	Norgold	223	58	76
Red Pontiac	273	68	71	Minn 157	216	91	68
Katahdin	266	63	75	Hunter	206	81	79
Average	318	67	75				

1/ Cooperators: Growers: Albert and Marvin Johnson, Fosston, Minnesota
County Agricultural Agent, Harley Shurson, East Polk County,
McIntosh, Minnesota

Planted: May 27, 1966

Harvested: October 20, 1966

Spacing: Row 38", Hills 12"

Fertilizer: With planter 225 lbs. 8-32-16

2/ See footnote 1, table 1.

Minnesota table 6. Potato variety demonstration planting, Hollandale, Minnesota, 1966^{1/}

Variety	Yield Per Acre		Specific Gravity ^{2/}	Variety	Yield Per Acre		Specific Gravity ^{2/}
	Total	US No.1			Total	US No.1	
	Cwt.	Pct.			Cwt.	Pct.	
Kennebec	409	95	55	Minn 201	301	86	69
Chieftain	400	95	62	Katahdin	300	95	57
Irish Cobbler	373	95	68	Minn 140	286	79	76
Platte	347	92	60	Norgold	280	93	62
Red Pontiac	346	95	52	Hunter	279	92	65
Viking	328	97	54	Superior	265	97	65
Norland	320	95	59	Anoka	258	96	62
Bounty	314	86	62	Minn 101	257	91	63
Cherokee	312	94	67	Minn 102	257	92	61
Pennchip	301	97	64	Minn 157	240	94	58
				Minn 154	176	84	70
Average	302	92	62				

1/ Cooperators: Grower: William and Albert Veldman, Hollandale, Minnesota
County Agricultural Agent, Eldon Fenske, Freeborn County,
Albert Lea

Planted: May 19, 1966

Harvested: October 25, 1966

Spacing: Row 34", Hills 12"

Fertilizer: Broadcast--500 lbs/A 0-12-36
Band with planter--225 lbs/A 8-32-16
Minor elements added

2/ See footnote 1, table 1.

Minnesota table 7. Potato variety demonstration planting, Ossec, Minnesota, 1966^{1/}

Variety	Yield Per Acre		Specific Gravity ^{2/}	Variety	Yield Per Acre		Specific Gravity ^{2/}
	Total	US No.1			Total	US No.1	
	Cwt.	Pct.			Cwt.	Pct.	
Kennebec	477	98	62	Viking	402	86	58
Anoka	474	92	65	Minn 201	398	97	59
Bounty	458	93	66	Waseca	397	96	61
Chieftain				Red Pontiac	387	96	45
(I57410)	453	94	65	Minn 140	385	80	66
Superior	443	96	69	Russet Burbank	370	94	71
Irish Cobbler	421	84	65	Pennchip	354	96	65
Minn 154	416	92	61	Norland	349	92	86
Minn 102	414	95	63	Early Gem	348	97	59
Minn 157	413	96	53	Norgold	325	97	62
Platte	406	92	61				
Average	404	93	63				

1/ Cooperators: Grower: Wilbur Goetze
County Agricultural Agent, George Roadfeldt
Planted: May 5, 1966
Harvested: October 11, 1966
Spacing: Row 36", Hills 12"
Fertilizer: Broadcast Fall--500 lbs/A 0-0-60
Broadcast Spring--250 lbs/A 33-0-0
Band with planted--900 lbs/A 8-24-12
Sidedressed (Plants 6-8" tall) 200 lbs/A 33-0-0

2/ See footnote, 1, table 1.

Minnesota table 8. Potato variety demonstration planting, Morris, Minnesota, 1966^{1/}

Variety	Yield Per Acre		Specific Gravity ^{2/}	Variety	Yield Per Acre		Specific Gravity ^{2/}
	Total	US No.1			Total	US No.1	
	Cwt.	Pct.			Cwt.	Pct.	
Kennebec	309	77	85	Pennchip	207	76	80
Red Pontiac	307	79	70	Norgold	182	86	77
Bounty	287	83	83	Minn 201	181	66	78
Irish Cobbler	266	68	68	Norland	179	75	70
Russet Burbank	264	95	89	Minn 102	172	61	85
Platte	250	74	85	Katahdin	163	87	76
Early Gem	246	80	70	Viking	145	90	77
Superior	243	88	81	Minn 157	124	71	56
Anoka	221	73	80	Minn 154	117	61	77
Chieftain	214	68	69	Minn 140	110	39	103
Average	209	75	1.078				

1/ Cooperator: Grower: Wes Gray
West Central Experiment Station, Morris, Minnesota
Planted: May 16, 1966
Harvested: September 14, 1966
Spacing: Row 36", Hills 12"

2/ See footnote 1, table 1.

Minnesota table 9. Relative resistance of various tuber-bearing Solanum introductions to attack by the green peach and potato aphids, and the potato leafhopper. Grand Rapids, Minnesota. August 12-17, 1966.

IR-1 No.	Species variety or hybrid	Country of origin	Collector or donor no. ^{1/}	Insects Per Plant ^{2/}		
				Green Peach Aphid Number	Potato Aphid Number	Potato leaf- hopper Number
175396	<u>acaule</u>		EBS 208A	13.17	1.21	2.63
186176	<u>acaule</u>	Peru	Och	13.13	0.69	0.13
210029	<u>acaule</u>	Bolivia	Hje 994	3.63	0.19	1.79
217450	<u>acaule</u>	Argentina	Sleu 4114	1.15	1.42	2.94
225620	<u>acaule</u>		CCC 592	10.33	0.69	0.98
255501	<u>acaule</u>	Argentina	Bru 802	16.61	0.46	2.23
275126	<u>acaule</u>	"	Hje 353B	5.77	0.13	0.79
275129	<u>acaule</u>	Peru	Hje 1582	6.21	0.33	1.92
275133	<u>acaule</u>	Argentina	Hje 1898	5.06	1.81	6.56
			Species Mean	8.34	0.77	2.22
230495	<u>acroscopicum</u>	Peru	Och 2043	6.90	0.90	3.63
			Species Mean	6.90	0.90	3.63
255490	<u>ajanhuiri</u>	Bolivia	CEBA 17	6.13	0.13	4.00
WRF 1270	"			1.79	2.54	8.17
			Species Mean	3.96	1.33	6.08
265858	<u>berthaultii</u>	Bolivia	EBS 1846	7.00	0.42	0.00
283069	<u>berthaultii</u>	Bolivia	EBS 1842	22.25	7.50	0.75
			Species Mean	14.63	3.96	0.38
265861	<u>boliviense</u>	Bolivia	EBS 1847	9.13	1.29	3.83
			Species Mean	9.13	1.29	3.83
WRF1271	<u>brachistotrichum</u>			0.42	0.40	0.69
			Species Mean	0.42	0.40	0.69
275183	<u>brachycarpum</u>	Mexico	Haw 1710	10.75	0.06	0.44
			Species Mean	10.75	0.06	0.44
230506	<u>bukasovii</u>			3.83	0.08	0.50
265876	"	Peru	EBS 1899	1.25	2.42	2.17
275271	"	"	" 1900	0.13	0.50	1.63
			Species Mean	1.74	1.00	1.43
243505	<u>bulbocastanum</u>	Mexico	Gra 361x359	0.38	2.13	1.13
243507	"	"	" 386x362	0.00	2.29	2.36
243508	"	"	" 395x359	1.50	0.00	1.25
275186	"	"	Haw 1583	0.00	0.50	1.92
275187	"	"	" 1584	0.67	0.00	4.46
275188	"	"	" 1585	0.00	0.13	4.06
275189	"	"	" 1586	0.25	0.00	0.88
275198	"	"	" 1595	1.50	3.50	1.00
			Species Mean	0.54	1.07	2.13

continued

Minnesota table 9, continued.

184765.4	<u>cardiophyllum</u>	Mexico	Haw 1095	1.75	0.75	3.75
283062	"		Gra	3.00	2.13	0.38
			Species Mean	2.38	1.44	2.06
265863	<u>canasense</u>	Peru	EBS 1825	2.06	0.19	1.94
266385	"	"	Cor P750	2.69	0.63	1.25
283074	"	"	EBS 1921	0.81	3.31	2.13
			Species Mean	1.85	1.38	1.77
230582	<u>chacoense</u>		Slee	21.44	1.63	0.25
275139	"	Argentina	Hje 297	4.52	1.46	3.44
WRF 305	"			7.19	1.50	0.19
" 306	"			8.63	0.81	0.13
			Species Mean	10.44	1.35	1.00
266387	<u>chomatophilum</u>	Peru	Cor P862	1.83	2.42	0.08
			Species Mean	1.83	2.42	0.08
243503	<u>commersonii</u>	Argentina		3.06	0.56	1.69
			Species Mean	3.06	0.56	1.69
186181	<u>curtilobum</u>	Peru	Och	6.02	0.52	2.81
225649	"	Colombia	CCC 479	7.94	0.71	4.31
225650	"	"	CCC 480	2.69	0.17	6.56
225651	"	"	CCC 481	3.21	1.15	4.61
			Species Mean	4.96	0.64	4.57
161155	<u>demissum</u>	Mexico	Cor 14224	4.13	0.00	0.69
161164	"	"	Cor 14237	1.69	0.44	0.06
160229	"	"	Cor 14219	3.98	0.17	1.63
161167	"	"	Cor 14240	8.86	0.13	3.29
161719	"	"	Cor 14413	6.75	0.13	0.06
186561	"	"	Haw 1117	5.17	0.38	1.81
201850	"		Belg Dem 48	4.13	1.63	0.00
218047	"		BB	5.81	0.65	0.21
230589	"	"	Redd 178	6.06	0.19	0.06
			Species Mean	5.17	0.41	0.87
186548	<u>ehrenbergii</u>	"	Haw 1100	0.54	0.96	3.42
186549	"	"	Haw 1102	3.19	0.00	3.54
275214	"	"	Haw 1429	0.31	1.65	1.96
WRF 276	"			0.56	0.56	0.81
WRF 1276	"			0.25	4.21	0.88
			Species Mean	0.97	1.47	2.12
262895	<u>fendleri</u>	"	Gen	0.88	0.42	3.42
275156	"	USA	Haw 1156	3.69	2.50	8.56
275157	"	USA	Haw 1157	3.19	3.06	3.88
275158	"	USA	Haw 1158	1.13	3.25	3.50
275161	"	USA	Haw 1174	6.67	3.92	0.92
275164	"	USA	Haw 1204	5.63	1.50	2.17
283102	"	Mexico	Haw 1314	0.31	2.94	3.38
			Species Mean	3.07	2.51	3.69

continued

Minnesota table 9, continued.

210038	<u>gourlayi</u>	Argentina	Hje 962	0.23	0.44	1.17
			Species Mean	0.23	0.44	1.17
161730	<u>guerreroense</u>	Mexico	Cor 14410	9.75	0.56	0.31
			Species Mean	9.75	0.56	0.31
186559	<u>hjertingii</u>	"	Haw 1113	1.67	0.17	3.34
186560	"	"	Haw 1114	1.31	0.13	1.19
251063	"	"	Haw 1355	0.25	0.13	4.06
251067	"	"	Haw 1378	1.58	2.71	1.13
275174	"	"	Haw 1356	1.06	1.19	1.00
			Species Mean	1.18	0.86	2.14
161174	<u>hougasii</u>	"	Cor 14253	1.79	0.13	0.25
			Species Mean	1.79	0.13	0.25
195190	<u>jamesii</u>		CPC 1439	0.25	0.00	1.25
275262	"	USA	Gra 381x386	0.50	3.44	0.81
275266	"	USA	Gra 388x384	1.56	4.00	0.69
			Species Mean	0.77	2.48	0.92
230584.4	<u>kurtzianum</u>			19.75	0.63	0.00
			Species Mean	19.75	0.63	0.00
208563	<u>maglia</u>	Argentina	Bru 39	15.13	3.25	1.00
			Species Mean	15.13	3.25	1.00
210040	<u>marinasense</u>	Peru	Hje 1531B	0.25	0.00	0.67
265872	<u>medians</u>	"	EBS 1905	1.44	0.88	0.38
			Species Mean	1.44	0.88	0.38
210034	<u>megistacrolobum</u>	Bolivia	Hje 1028	6.75	1.21	2.04
265578	"	"	Cor B654	3.90	2.52	0.90
265873	"	"	EBS 1793	2.36	2.35	1.19
265874	"	"	EBS 1808	2.44	0.69	1.13
265879	"	Argentina	EBS 1783	0.71	2.54	0.71
275147	"	"	Hje 366	7.00	1.00	1.50
283082	"	Bolivia	EBS 1787	2.83	0.38	2.83
			Species Mean	3.71	1.53	1.47
210042	<u>multidissectum</u>	Peru	Hje 1337	0.25	0.38	0.75
210044	"	"	Hje 1366	0.50	0.13	0.88
210052	"	"	Hje 1407	1.29	0.40	0.88
210055	"	"	Hje 1583	2.08	0.25	0.65
			Species Mean	1.03	0.29	0.79
251741	<u>papiia</u>	Mexico	Haw 1476	3.75	0.38	2.94
275227	"	"	Haw 1482	1.81	2.00	2.69
275228	"	"	Haw 1486	3.81	1.88	4.31
283105	"	"	Haw 1475	2.00	2.94	1.44
			Species Mean	2.84	1.80	2.84

continued

Minnesota table 9, continued.

225667	<u>phureja</u>	Colombia	CCC 147	3.25	1.67	10.84
225672	"	"	CCC 125	2.31	0.46	7.75
225673	"	"	CCC 178	4.42	0.50	7.52
225675	"	"	CCC 131	1.23	1.65	4.11
225677	"	"	CCC 181	3.75	2.00	5.88
225679	"	"	CCC 133	2.67	0.25	5.88
225681	"	"	CCC 143	4.83	1.63	7.29
225682	"	"	CCC 193	2.08	1.17	7.67
225683	"	"	CCC 192	0.88	0.58	5.67
225688	"	"	CCC 234	6.38	1.13	2.69
225694	"	"	CCC 10	4.77	3.11	3.73
243460	"	"	CCC 80	1.63	1.31	5.75
243462	"	"	CCC 117	1.21	2.25	14.38
258855	"	Bolivia	Gan	2.94	1.83	3.65
283116	"	Colombia	Och 1399	1.92	0.25	4.04
			Species Mean	2.95	1.32	6.45
275231	<u>pinnatisectum</u>	Mexico	Haw 1426	3.40	3.25	0.21
275234	"	"	Haw 1456	7.54	2.08	0.15
275235	"	"	Haw 1457	3.94	1.88	0.00
			Species Mean	4.96	2.40	0.12
175444	<u>polyadenium</u>	"	EBS 51	2.44	3.13	0.50
			Species Mean	2.44	3.13	0.50
184770	<u>polytrichon</u>	"	Haw 1101	1.86	0.08	0.06
184773	"	"	Haw 1104	0.63	0.56	0.25
275240	"	"	Haw 1467	1.67	0.61	0.79
275241	"	"	Haw 1669	3.54	1.29	0.38
283106	"	"	Haw 1469	1.38	0.38	0.38
WRF 547	"			0.38	0.06	0.15
WRF1282	"			1.75	0.69	0.50
			Species Mean	1.60	0.52	0.36
210048	<u>raphanifolium</u>	Peru	Hje 1521	3.90	1.08	3.17
210049	"	"	Hje 1529	5.29	1.71	1.25
246488	"	"	Cor P218	3.50	1.13	1.56
			Species Mean	4.23	1.31	1.99
275242.3	<u>sambucinum</u>	Mexico	Haw 1439	4.25	3.00	0.25
			Species Mean	4.25	3.00	0.25
205397	<u>sanctae-rosae</u>	Argentina	Bru	0.75	2.00	3.88
218221	" "	"	EBS 438	0.79	0.46	4.33
230464	" "	"	CPC 2483	0.44	0.77	4.52
275152	" "	"	Hje 328	1.13	2.25	1.38
283089	" "		EBS 1779	0.19	1.38	4.13
			Species Mean	0.66	1.37	3.65

continued

Minnesota table 9, continued.

218224	<u>simplicifolium</u>	Argentina	EBS 447	18.88	1.48	6.81
218226	"		EBS 626	11.77	0.85	3.61
265575	"	"	Cor A705	6.94	4.23	4.17
WRF1283	"			9.81	0.44	6.19
			Species Mean	11.85	1.75	5.19
218218	<u>spgazzinii</u>			0.54	1.42	0.31
275143	"			3.94	2.54	0.31
			Species Mean	2.24	1.98	0.31
255527	<u>stenophyllidium</u>	Mexico	Gra 346x348	0.29	1.83	0.63
255529	"	"	Gra 347x348	0.00	1.42	1.50
			Species Mean	0.15	1.63	1.06
195214	<u>stenotomum</u>	Peru	CPC 1793	1.92	0.77	2.17
230513	"	"	Och 1933	4.38	1.67	6.13
234007	"	Bolivia	Gan 29	5.42	1.11	2.77
234011	"	"	Gan 31	1.54	2.17	0.92
234012	"	"	Gan 9	4.00	1.75	1.71
258909	"	"	Car	8.75	4.38	0.75
258910	"	"	Car	4.50	0.25	3.88
WRF1284	"			1.86	0.50	12.19
WRF1285	"			1.06	1.02	7.08
			Species Mean	3.71	1.51	4.18
160226	<u>stononiferum</u>	Mexico	Cor 14213	0.25	0.25	3.25
161178	"	"	Cor 14263	1.42	0.19	4.44
186563	"	"	Haw 1119	1.42	0.81	2.61
205522	"	"	CPC 28.4	0.38	0.31	1.56
255532	"	"	Gra 334	0.08	0.90	2.81
255534	"	"	Gra 366	1.81	0.88	1.25
255535	"	"	Gra 368	0.63	0.75	0.94
275244	"	"	Haw 1293	0.69	0.31	2.50
275245	"	"	Haw 1388	0.94	0.25	6.13
275246	"	"	Haw 1392	0.94	0.00	4.31
275247	"	"	Haw 1403	0.94	0.38	3.06
275249	"	"	Haw 1521	0.06	0.19	1.25
275251	"	"	Haw 1669	4.94	0.75	2.56
275252	"	"	Haw 1720	0.00	1.02	1.42
			Species Mean	1.03	0.50	2.72
230465.6	<u>sucrense</u>	Bolivia	CPC 2058	12.75	1.13	0.63
283091	"		EBS 1807	2.25	0.13	3.69
			Species Mean	7.50	0.63	2.16
255538	<u>trifidum</u>	Mexico	Gra 308x301	0.75	1.50	2.00
			Species Mean	0.75	1.50	2.00

continued

Minnesota table 9, continued.

TUBEROSUM SUBSP.

184903	<u>andigena</u>	Guatemala		0.40	0.94	2.79
186177	"	Peru	Och	1.08	0.21	1.48
186178	"	"	Och	2.94	1.56	7.81
186179	"	"	Och	5.44	0.88	5.94
186180	"	"	Och	4.31	1.56	3.06
189473	"	Mexico	Bal	3.29	0.94	3.06
195162	"		CPC 300	1.33	1.25	3.17
195211	"		CPC 1704	4.50	1.00	7.13
197757	"	Bolivia	FCE 100	3.73	0.23	5.92
197932	"	Colombia	CCC	2.00	1.25	4.31
197933	"	"	CCC	4.29	0.88	3.04
205622	"		CPC 1673x2201(30)	1.25	1.71	4.44
205623	"		CPC 1673x2201(85)	5.00	0.44	6.81
205624	"		CPC 1673x2201(182)	2.13	1.19	10.31
209415	"	Argentina	Bru 61	7.50	0.75	9.94
209417	"	"	Bru 63	4.94	1.19	6.69
209419	"	"	Bru 65	4.88	0.38	9.00
230457	"		CPC 1464	6.25	1.00	4.38
230474	"	Peru	LAIAS 3323	2.40	0.44	1.86
230496	"	"	Och 808	1.90	1.04	2.13
230498	"	"	Och 868	1.46	2.79	2.08
230499	"	"	Och 1226	1.46	2.79	2.08
230500	"	"	Och 1245	2.36	0.67	6.11
232839	"	"		3.02	0.50	3.92
233992	"	Bolivia	Gan 39	3.88	0.31	3.40
233994	"	"	Gan 23	2.00	0.00	7.56
233997	"	"	Gan 45	2.44	0.31	9.19
233998	"	"	Gan 34	3.63	1.19	13.81
WRF1290	"			1.92	0.69	10.00
WRF1292	"			3.90	0.92	10.40
WRF1293	"			6.88	1.06	8.75
				3.88	0.54	7.81
			Species Mean	3.38	0.90	6.01

TUBEROSUM SUBSP.

209426	<u>tuberosum</u>	Argentina	Bru 73	5.56	0.50	12.19
209433	"	"	Bru 81	1.02	1.17	5.69
214422	"	Peru	Smi 449	1.61	1.23	3.50
214423	"	"	Smi 450	2.46	1.23	6.71
214424	"	"	Smi 451	2.63	0.88	3.38
214425	"	"	Smi 452	1.94	1.46	4.90
214426	"	"	Smi 453	2.73	0.33	7.67
214430	"	"	Smi 460	4.19	0.44	3.06
214434	"	"	Smi 464	3.86	2.98	3.29
214435	"	"	Smi 465	1.04	0.13	2.79
214436	"	"	Smi 466	7.52	0.23	9.83
214441	"	"	Smi 503	7.25	0.94	4.56
214442	"	"	Smi 504	9.75	0.81	5.63
214443	"	"	Smi 505	8.90	1.65	1.88

continued

Minnesota table 9, continued.

225627	<u>tuberosum</u>	Colombia	CCC 5	5.42	1.67	6.94
225628	"	"	CCC 405	2.81	1.13	4.13
225629	"	"	CCC 47	8.17	1.17	2.13
225630	"	"	CCC 682	2.56	0.81	3.50
225632	"	"	CCC 46	3.77	0.65	3.08
225633	"	"	CCC 61	15.25	0.00	2.25
225635	"	"	CCC 427	7.00	2.25	5.50
225637	"	"	CCC 687	10.33	2.58	5.04
230470	"	Ecuador	IAIAS 3319	7.50	0.56	5.75
230472	"	Colombia	IAIAS 3321	7.38	0.75	5.04
230475	"	Costa Rica	IAIAS 3346	3.79	1.58	3.86
232041	"	Peru	LEEA 6	3.00	0.19	8.81
232840	"	"	"	2.00	1.25	4.50
232841	"	"	"	4.50	0.40	6.67
232842	"	"	"	4.17	0.88	4.25
233981	"	Bolivia	Gan 10	9.75	1.67	8.38
233982	"	"	Gan 16	11.96	0.71	6.38
233984	"	"	Gan	0.67	0.08	7.50
233985	"	"	Gan 12	3.75	0.63	4.54
233987	"	"	Gan 59	9.58	0.00	10.54
233988	"	"	Gan 47	0.88	2.19	10.06
234000	"	"	Gan 2	4.21	0.31	3.25
234002	"	"	Gan 24	3.06	0.88	11.25
234585	"	Colombia	CCC 140	5.65	0.65	3.67
237208	"	Ecuador	Diaz 5	1.23	0.38	4.52
243343	"	Mexico	Gra 97-2	1.19	2.21	3.27
243360	"	Colombia	CCC 2	2.63	1.88	2.88
243361	"	"	CCC 4	3.54	1.25	4.04
243365	"	"	CCC 23	3.29	0.92	4.58
243366	"	"	CCC 27	5.29	0.63	6.75
243368	"	"	CCC 32	8.63	0.88	3.25
243370	"	"	CCC 39	6.21	0.69	7.19
243371	"	"	CCC 43	10.63	0.13	5.13
243373	"	"	CCC 49	5.63	0.67	4.61
243374	"	"	CCC 51	6.50	0.75	2.56
243377	"	"	CCC 58	3.63	0.52	3.19
243378	"	"	CCC 59	0.88	0.13	3.00
243379	"	"	CCC 60	11.00	0.63	3.54
243381	"	"	CCC 107	1.00	0.50	3.63
243382	"	"	CCC 109	1.54	1.77	3.11
243384	"	"	CCC 114	2.48	0.79	2.15
243385	"	"	CCC 128	1.98	0.88	4.86
243386	"	"	CCC 132	2.46	1.54	3.17
243387	"	"	CCC 137	0.23	0.85	4.77
243388	"	"	CCC 138	5.36	2.23	3.69
243390	"	"	CCC 141	1.77	1.06	1.31
243392	"	"	CCC 156	2.00	1.31	4.94
243393	"	"	CCC 158	2.92	1.21	1.67
243394	"	"	CCC 160	6.71	0.92	8.36

continued

Minnesota table 9, continued.

243395	<u>tuberosum</u>	Colombia	CCC 161	2.73	1.61	1.90
243396	"	"	CCC 162	5.25	0.81	6.90
243397	"	"	CCC 165	1.71	0.79	4.29
245317	"	Chile	Cor C8	0.63	1.63	1.13
245820	"	"	Cor C11	7.33	1.21	2.33
245341	"	"	Cor C101	3.88	1.63	1.63
245933.1	"	"	Cor C130	2.63	0.67	4.75
280863	"	Argent	WAC 27	3.63	0.50	9.75
280866	"	Argent	WAC 37	4.79	0.42	3.13
280868	"	"	WAC 63	5.86	1.00	11.58
280869	"	"	WAC 64	0.79	0.29	3.69
280871	"	"	WAC 70	1.63	0.56	5.44
280874	"	"	WAC 100	3.25	0.44	6.75
280875	"	"	WAC 101	3.88	1.06	5.69
280877	"	"	WAC 117	2.21	2.17	4.94
280883	"	"	WAC 142	2.33	0.58	13.25
280887	"	"	WAC 160	3.00	0.58	4.25
280888	"	Peru	WAC 1004	2.23	2.13	4.67
280889	"	"	WAC 2008	6.35	1.50	8.56
280890	"	"	WAC 1025B I	1.83	0.90	9.21
280891	"	"	WAC 1028A	6.13	0.17	7.17
280896	"	"	WAC 1115 I	3.40	1.11	3.17
280897	"	"	WAC 1118	7.63	0.73	7.13
280902	"	"	WAC 1160B	2.77	0.73	6.36
280903	"	"	WAC 1106A	1.98	2.33	3.08
280905	"	"	WAC 1194	8.50	0.17	4.08
280908	"	"	WAC 1206	2.33	0.48	2.63
280909	"	"	WAC 1207A II	0.19	1.19	5.17
280910	"	"	WAC 1207B II	7.13	1.13	4.38
280914	"	"	WAC 1223	3.21	0.71	3.13
280915	"	"	WAC 1225A	4.36	1.08	8.23
280958	"	"	WAC 1463	2.55	0.75	5.49
280997	"	Boliv	WAC 739	2.69	0.33	4.61
281003	"	"	WAC 757	3.06	0.50	5.50
281014	"	"	WAC 810	1.00	2.25	4.50
281021	"	"	WAC 837	4.42	0.42	1.13
281025	"	"	WAC 409	5.21	2.71	2.77
281033	"	Mexico	WAC 910	2.54	0.67	6.42
281035	"	"	WAC 912	4.35	0.42	2.65
281059	"	Peru	WAC 198	1.50	1.50	3.59
281119	"	"	WAC 370	5.44	0.50	5.19
				4.45	0.98	5.02

continued

Minnesota table 9, continued.

TUBEROSUM SUBSP.

<u>tuberosum</u> ,	Chisago				4.02	0.19	14.00	
"	Norland				15.69	2.94	7.44	
"	Pontiac				4.94	0.75	21.25	
"	Red Warba				11.65	2.88	11.79	
"	Russet Burbank				2.50	0.50	8.56	
"	Minn. Code	4			10.56	1.13	8.56	
"	"	"	43		6.15	1.69	5.36	
"	"	"	49		6.02	1.34	11.77	
"	"	"	87		2.44	0.44	10.06	
"	"	"	98		14.50	1.67	3.71	
"	"	"	101		2.69	0.06	19.04	
"	"	"	148		8.11	1.15	10.02	
"	"	"	154		10.92	4.31	4.94	
"	"	"	157		11.54	4.96	8.63	
"	"	"	212		7.02	1.04	7.75	
					Species Mean	7.92	1.67	10.19
USW 584 (Kennebec x <u>chacoense</u>) Bulk					15.27	3.40	1.79	
					Mean	15.27	3.40	1.79
USW 973 (AG-23 x <u>megistacrolobum</u>) Bulk					6.38	1.25	2.00	
					Mean	6.38	1.25	2.00
245933 Unident. Cult. Species Chile					Cor C131	3.38	0.19	7.48
					Mean	3.38	0.19	7.48
251724 Unident. Non-cult. Spp. Mexico					Haw 1402	1.19	0.33	1.31
255547 " " " "					Gra 358	3.56	1.06	0.75
255548 " " " "					Gra 362	1.27	1.42	1.88
					Mean	2.01	0.94	1.31
218220 <u>venturii</u>	Argentina				EBS 195	1.06	0.69	4.06
					Species Mean	1.06	0.69	4.06
230562 <u>vernei</u>	Argentina				EBS 181	5.06	2.19	5.38
					Species Mean	5.06	2.19	5.38
161173 <u>verrucosum</u>	Mexico				Cor 14252	0.50	1.31	0.56
195172 "	"				CPC 544	2.94	0.25	1.13
255543 "	"				Gra 304	1.08	0.58	3.86
275254 "	"				Haw 1513	0.17	1.84	1.33
275255 "	"				Haw 1527	3.88	1.08	0.69
275257 "	"				Haw 1532	1.19	0.50	1.56
275260 "	"				Haw 1658	5.13	1.00	3.63
					Species Mean	2.13	0.94	1.82

1/ See Wis. Bull. 533 for explanation of collector's or donor's prefix and stock numbers.

2/ Standard error of means: green peach aphid 2.61; potato aphid 0.82; and potato leafhopper 0.47 (4-16 plants per introduction sampled).

MISSISSIPPI
H. L. Hammett

Potato production in Mississippi doubled in 1966 and similar increases are foreseen for 1967 and 68. Production in Mississippi has been for the potato chip industry and for the frozen food processor for use as frozen french fries. Both uses require potatoes of relatively high specific gravity and acceptable yield. Twelve commercial varieties and eight seedlings from various sources were grown in Mississippi during 1966 and evaluated for yield and specific gravity. The results are shown in Mississippi table 1.

Growing Conditions at Poplarville: Plots at Poplarville were located on a medium to fine sandy loam soil. The plots were planted February 21 and fertilized at the rate of 1000 pounds of 12-16-16 per acre. Good plant stands were obtained with all varieties except Red LaSoda and LaChipper. Plots were harvested June 14. Inadequate moisture and high temperatures in May and early June hampered crop growth and yield.

Growing Conditions at Crystal Springs: Date of planting, March 9, 1966, was later than normal. Sprout emergence was good for all varieties and lines. Excessive rainfall occurred during the period of April 18 to May 19. The total for this period was in excess of 11 inches. Complete plants as well as individual tubers were lost, thus the low yields recorded.

Growing Conditions at State College, Mississippi: Plots were planted March 10 and harvested June 10. Soil type was a medium sandy loam with appreciable quantities of clay. Fertilization was at the rate of 1000 pounds per acre of 12-16-16. Supplementary irrigation water was applied to maintain good growing conditions.

Growing Conditions at Stoneville and Sardis: The plots at Stoneville and Sardis were planted March 22 and March 24 and harvested June 22 and June 29 respectively. Plots at both locations were on a fine sandy to silt loam soil. Precipitation at Sardis was below normal but adequate. The rainfall at Stoneville was inadequate but supplementary irrigation water was applied.

Disease was not a problem in any plots and no fungicides were applied. All plots were sprayed once with Sevin, 80% wettable powder at 1-1/2 pounds per acre for the control of the Colorado potato beetles. The plots at Poplarville received a second application. The following notes on the appearance of the varieties and lines at harvest were made:

B5063-3--Long oval, light rose color, eyes medium deep--smooth, no sprouts.
B5088-7--Long oval to oblong, white with appreciable greening, shallow eyes, very smooth, no sprouts.
B5141-6--Long oval, white with appreciable greening, eyes medium shallow, sprouts just beginning to break.
Morgold Russet--Oblong, deep russet, smooth, eyes very shallow, some sprouts beginning to break.

- Sebago--Oval to long oval, white with very slight greening, eyes medium shallow, no sprouting, lenticels fairly heavy.
- LaChipper--Oval, white with very little greening, eyes deep, no sprouting, few lenticels.
- B5011-7 --Long oval, white, eyes medium shallow, second growth very evident, some sprouts beginning to break, skin easily.
- B5031-13 --Long oval, white, eyes medium to shallow, no sprouting, few and small lenticels, a beautiful white.
- Red LaSoda--Oval to long oval, dark rose red, eyes medium to deep, few lenticels, no sprouting.
- Arenac --Oval to long oval, some flat in one plane, white, slight greening, eyes medium to shallow, few lenticels, some sprouts just beginning to break.
- Redskin --Oval, red, eyes medium, few small lenticels, some sprouts just beginning to break.
- Kennebec --Long oval to oblong, white, medium lenticels, eyes shallow, most sprouts beginning to break well.
- White Rose--Oblong to long, white, medium to heavy lenticels, some second growth, most sprouts breaking well.
- Cherokee --Oval to long oval, white, medium lenticels, eyes shallow, some second growth, some sprouts beginning to break.
- Superior --Long oval to oblong, white, lenticels few but large, eyes shallow, no sprouting, some second growth.
- Haig --Oval to long oval, light to medium russet, lenticels few but large, no sprouting, no second growth.
- L22-111 --Oval to long oval, red, eyes shallow, very few lenticels, no sprouts, no second growth, very beautiful.
- L22-112 --Oval, red, eyes shallow to shallow medium, tends to flatten in one plant, few lenticels, no sprouting.
- L21-261 --Oval to long oval, white, eyes medium, no sprouting, some second growth.
- Russet Burbank--Oblong to long, deep russet, eyes shallow, many sprouts 1/4 inch or longer, heavy second growth--very rough.

Mississippi table 1. Yields and specific gravity of Irish potatoes in Mississippi in 1966.

Variety or seedling	Poplarville ^{2/}		Sardis ^{1/}		State College		Stoneville		Crystal Springs	
	Yield Per Acre	Specific Gravity	Yield Per Acre	Specific Gravity	Yield Per Acre	Specific Gravity	Yield Per Acre	Specific Gravity	Yield Per Acre	Specific Gravity
	Cwt.		Cwt.		Cwt.		Cwt.		Cwt.	
Arenac			197	76						
Red IaSoda	51	55	212	66	261	66			110	59
Redskin	119	61	189	75					125	65
LaChipper	77	63	216	70	237	75	199	72	125	63
Kennebec	132	60			284	69	158	69	150	68
Russet Burbank	118	59			232	81			110	75
Superior					221	68	201	70	55	65
Sebago	215 ^{3/}	59	162	69					110	66
Norgold Russet			137	75						
Cherokee										
White Rose							170	75		
Haig					230	66	230	66	55	70
L21-26					126	75				
L22-111					194	83				
L22-112					182	70				
B5088-7					323	67				
B5063-3	97 ^{2/}	68	166	67					45	74
B5011-7	101 ^{2/}	72	125	83						
B5141-6	214 ^{3/}	66	156	73					115	66
B5031-18	109 ^{2/}	81	197	93					105	81
	43 ^{3/}	75	201	74					90	74
LSD .05	28		25		32		28			
LSD .01	39		34		43		37			

^{1/} Grown in cooperation with Hayes Bros. and Hall Plantation--Sardis, Mississippi.

^{2/} Specific gravity values--1.0 omitted.

^{3/} Non-replicated, observational plot only.

NEBRASKA

Robert B. O'Keefe

Four hundred and seventeen clones were screened for yield and scab (Straptomyces scabies) reaction under field conditions using 2 replicates of 5 hills at 2 locations in western Nebraska. The plots were planted May 28 to June 3 and harvested September 28 to October 4. Average to optimum irrigation was practiced during the early season. At one location (North Platte Valley) a severe infection of late blight occurred in late August and irrigation water was withheld. The epidemic permitted the critical evaluation of the clones for reactions to the organism, but yields were suppressed.

The clones were evaluated for their ability to reconstitute following 6 months of 38° F. storage and 3 weeks' storage at 65°-70° F. Chip color (Rd values) was determined for potato chips fried at 375° F. for 1-3/4 minutes. Reducing sugar (mg/100 grams fresh weight) content was determined by the Hassid method. Specific gravity determinations were made with the in-water and in-air weight method.

Reactions of 85 advanced clones to Verticillium (microsclerotial) and Fusarium wilts were obtained by the "tooth-pick" inoculation method as described in the 1961-62 reports.

Data for the most promising clones are presented in Nebraska table 1. The rating scales for the various factors are as follows:

Values for Various Factors

Color W = white, DR = dark red, BR = bright red, MR = medium red,
Rus. = Russet White

Yield Cwt. per acre on the basis of 2 replicates of 5 hills at 2 locations.

Scab Scab type: 1 = Surface flecks, 2 = definite surface pustules,
3 = raised pustules, 4 = small pits, 5 = large, deep pits.

Late Blight (L.B.) 1 = definite small infection points, but few;
2 = small infection points developing into small lesions,
3 = 25% to 50% of the foliage infected; 4 = 50% to 75% of the foliage infected; 5 = 75 to 100 percent of the foliage infected. Type 1 may be due to major gene resistance. Types 2 and 3 indicate field tolerance or resistance.

General Rating (G.R.) Rating scale of 1 to 9 based on observed overall type, size, yield and grade quality. Ratings of 7 to 9 represent commercial potential.

Verticillium and Fusarium The "tooth pick" inoculation method (reported in 1961-62) was used to obtain an index for reactions of various clones to the organisms. S = index of 70 to 100 (susceptible), T = index of 45 to 70 (tolerant) and R = index of 0 to 45 (resistant).

Rd Value for Chip Color Rd value was determined with a Hunter Color Difference Meter, using a white standard of Rd = 90.4. Values of 25-30 = acceptable, 30-35 = good, 35+ = excellent.

Reducing Sugar Milligrams per 100 grams fresh weight as determined by the Hassid method. Values below 300 are acceptable.

Specific Gravity--Determined by the in-water and dry-weight method and coded to thousandths, i.e., omitting 1.0 _ _ _.

Irrigation, fertilizer and plant population studies were also conducted with a limited number of named varieties and clones. The results are obtainable in the publication "1966 Potato Trials in Nebraska," Horticulture Progress Report, Department of Horticulture and Forestry, College of Agriculture, Lincoln, Nebraska.

Nebraska table 1. Yield, quality, and disease reaction data for superior selections in the Nebraska program.

Clone	1966 Data					1964-65 Data				
	Color	Yield	Scab	L.B.	G.R.	Vert.	Fus.	Rd	Reducing Sugar	Sp. Gr.
Checks										
Platte	W	158	3.0	4	9	T	R	28.1	266	79
Bounty	DR	206	3.3	4	7	T	S	21.2	512	68
Haig	W	110	3.0	5	8	S	S	22.7	342	72
Norland	MR	222	3.7	5	8	-	-	19.2	469	76
R. Pontiac	MR	196	4.7	4	7	T	T	22.1	548	76
Kennebec	W	181	4.7	2	7	S	T	28.7	278	72
First Year										
73.60-H ₂₈	BR	149	3.3	3	9	-	-	24.9	246	65
72.60-H ₄	BR	133	3.0	2	9	-	-	12.8	704	78
71.60-H ₁₅	W	108	2.7	2	9	-	-	18.7	664	62
48.60-H ₅	W	172	2.0	5	9	-	-	30.0	403	82
45.60-H ₂₅	W	128	2.0	5	9	-	-	18.7	682	75
45.60-H ₂₄	W	94	2.3	1	9	-	-	21.8	605	73
45.60-H ₂₀	W	101	2.0	3	9	-	-	--	-	-
39.60-H ₂₄	W	197	2.0	3	9	-	-	--	-	-
39.60-H ₂₀	W	181	3.0	3	9	-	-	--	-	-
15.60-H ₃₁	BR	94	2.7	5	9	-	-	21.8	299	90
6.60-H ₁₈	BR	167	2.3	3	9	-	-	16.9	330	81
6.60-H ₅	BR	160	2.3	3	8	-	-	29.8	181	86
Second Year										
18.58-3	W	160	3.7	4	9	R	R	21.9	264	84
54.58-H ₃₃	W	126	2.7	5	9	S	S	33.9	376	78
116.59-3	DR	128	4.0	4	8	S	S	16.7	557	79
70.60-2	W	181	3.0	5	9	T	T	37.5	220	87
7.62-2	BR	213	2.0	5	8	T	T	32.2	240	80
9.62-1	BR	325	3.0	4	9	T	T	27.2	529	73
9.62-2	DR	215	3.0	5	9	T	T	20.0	570	75
15.62-3	W	261	2.7	5	9	R	R	30.2	455	84
24.62-1	W	208	2.7	3	8	S	S	32.9	385	83
41.62-1	BR	229	3.7	5	8	S	R	22.6	270	76
41.62-4	DR	114	2.0	3	9	R	R	31.8	394	65
47.62-1	DR	137	2.7	4	9	S	S	33.7	203	95
49.62-5	MR	201	3.3	4	8	S	S	28.5	276	89

continued

Nebraska table 1, continued.

76.62-1	W	135	3.3	5	9	R	T	28.0	378	92
21.63-2	BR	176	3.7	5	8	-	-	25.4	226	60
46.63-1	DR	137	3.3	4	8	-	-	35.0	253	68
176.63-1	W	208	2.7	5	9	-	-	32.4	220	87
D17.63-1	W	169	1.3	5	8	-	-	26.4	444	84
A3.62-26	DR	163	3.0	5	8	-	-	22.0	371	60
A9.62-10	DR	266	2.7	3	9	-	-	33.7	281	77
A9.62-14	W	126	2.7	3	9	-	-	--	-	-
A29.62-3	W	165	2.0	3	8	-	-	14.5	464	66
A45.62-4	DR	220	3.3	3	8	-	-	22.9	294	79
19.61-2	W	158	3.0	3	8	-	-	--	-	-

Three or More Years--Advanced Lines

178.55-1	BR	183	4.0	3	8	R	S	30.2	256	82
99.56-1	BR	183	1.7	4	8	-	-	29.0	284	81
99.56-3x	DR	213	2.0	2	8	T	T	27.9	390	67
412.56-2	BR	213	2.3	4	8	-	-	12.8	304	65
48.57-3	DR	192	3.0	5	8	T	R	22.2	358	80
68.57-3	BR	176	2.3	3	8	-	-	15.6	459	80
202.57-1	DR	259	3.0	3	8	S	S	32.4	312	80
45.51-3	W	199	2.3	3	9	R	R	24.7	491	85
16.55-1	W	291	2.7	3	8	T	T	37.0	198	88
91.57-H ₁₈	W	238	3.0	4	7	-	-	17.8	578	79
97.57-2	W	240	3.7	3	9	S	S	--	-	--
136.58-3	W	238	3.0	5	7	T	R	26.6	258	75

NEW HAMPSHIRE

Paul T. Blood

Sixteen varieties and selections were grown at Madbury, New Hampshire. Planting date was May 5; vines were killed September 8; harvest date was October 4. Seed piece spacing was 9 inches except for the varieties Russet Burbank (18 inches) and Norgold Russet (12 inches). The results are presented in New Hampshire table 1.

New Hampshire table 1. Yield, specific gravity, and chip color for 16 potato varieties grown at Madbury, New Hampshire, 1966.

Variety	Yield Per Acre			1/ Specific Gravity	50°F. Storage	2/ Chip Color Conditioned 80°F. 14 Days
	Above	Percentage of yield	Percentage of yield			
	1-½ inches	1-7/8 to 4 inches	2-½ to 4 inches			
	Cwt.	Pct.	Pct.			
Kennebec	389	95	83	72	7.3	4.2
Green Mountain	382	97	85	80	9.5	9.0
WY1122	356	93	53	76	9.3	8.0
Pennchip	349	96	84	70	5.4	1.7
Katahdin	332	93	83	70	8.0	5.2
B5141-6	322	96	75	90	6.2	2.0
B4123-10	311	96	75	64	8.4	5.7
Reliance	302	96	77	64	9.0	7.7
Menominee	297	94	86	69	8.2	7.2
Russet Burbank	296	49 (4-10 oz)		77	8.7	6.2
Mohawk	294	90	84	75	8.7	4.7
RD 45	292	95	63	71	5.7	2.5
Monona	291	96	75	64	4.6	1.5
Statelyle	284	90	53	73	7.7	5.7
Norgold Russet	250	59 (4-10 oz)		68	8.9	8.5
Norland	223	94	61	57	7.7	3.7
L.S.D. 0.05	58			02	1.0	
0.01	78			03	1.4	

1/ 1.0 omitted from specific gravity values.

2/ Chips with lower indices are lighter in color.

NEW JERSEY
John C. Campbell

Experiments to evaluate named and seedling potato varieties for yield, specific gravity, cooking, chipping and french frying were conducted by Rutgers--the State University at three locations. Due to the resignation of a staff member, the cooking tests have not yet been conducted.

Seabrook Farms. At this location we are primarily interested in varieties with high specific gravity that will produce frozen french fries of superior quality. Varieties with a specific gravity of 1.070 and above (weight in air and weight in water method) will be evaluated for baked, boiled, mashed, chipped, and french fried uses in the Food Science Department. They will also be evaluated as frozen french fries at the Seabrook Farms Quality Control Laboratory.

Potatoes were hand-planted April 21 at 12-inch intervals in 36-inch rows. Sixteen named and 39 seedling varieties were replicated four times, five seedlings three times, and 60 other seedlings were planted in single 20-hill plots. A 10-20-10 fertilizer deriving potassium from sulfate of potash was applied in bands at 1200 lbs. per acre. The potatoes were harvested after all plants were mature on September 9.

The potatoes were irrigated six times but should have been irrigated more often.

The Chippewa and ten seedlings produced U.S. No. 1 grade yields greater than Katahdin, while LaChipper and Hi-Plains and eight other seedlings produced yields similar to Katahdin. Only 12 varieties had a specific gravity of 1.070 or higher. It is of special importance that seedling B5141-6 produced the highest specific gravity and yield of those replicated four times. B5090-11 produced a slightly higher yield but was only replicated three times. (New Jersey table 1). In addition to the 60 varieties grown in replicated plots 60 other varieties were planted in 20-hill plots for observation. Of this group the following five produced yields over 300 cwt. of U.S. No. 1 per acre: B5718-6, B5701-4, B5696-3, 5765-1 (Picha), and B5696-1; while 13 others produced yields above 250 cwt. per acre (New Jersey table 1A). Seedlings in this group with a specific gravity above 1.070 were 5765-1, 5814-1, B5700-4, B6129-2.

Rutgers' Vegetable Research Farm. At the Vegetable Research Farm, New Brunswick, 16 named and 18 seedling varieties were replicated four times while four named and 25 seedling varieties were replicated three times. The seed was cut and treated with Captan dust about April 1 and machine-planted on April 15. Seed pieces were spaced 9-10 inches in 36-inch rows and 1800 lbs. of a 10-20-20 fertilizer was banded at planting. Plots were 20 feet long. The potatoes were irrigated by sprinklers six times, applying 2 inches of water each time. Harvest was on September 27 and 29 after all vines were dead. Highest yield of U.S.#1's (290 cwt./A) was produced by B5141-6, which also had the highest specific gravity of 1.089. Other high yielding varieties were B5299-39, 1L57410-10, B5287-16, B751-119, Kennebec, B5031-18, B5253-31, B3478-46, and 1L57410-2 among varieties replicated three times (New Jersey table 2). Top yields among varieties replicated four times were Chippewa, 77-57-1, Kennebec, Katahdin, Penobscot, ND5899-1, F5247, W639, Hi-Plains, and 5765-1 (Picha), (New Jersey table 3).

In addition to B5141-6 fifteen varieties had a specific gravity of 1.070 or above. These will be evaluated when baked, boiled, mashed, chipped, and french fried by our Food Science Department (New Jersey tables 2-3).

In addition to the 63 varieties grown in replicated plots, 61 seedlings were grown in a 20-hill observation plot. Yields of over 300 cwt. per acre of U.S. #1's in this group were produced by B5700-1, PA3MS9, B5617-5, B5635-9, B5690-5, B5700-4, B5701-5, and B6129-2. Seedlings with a S.G. of 1.070 or more were B5617-5, B6129-2, B5680-1, B5736-3, B5591-1 and B5669-4 (New Jersey table 3-A).

George Rue Farm. This test, conducted in cooperation with George Rue, Imlaystown, produced the highest yields of the three experiments. The potatoes were 2-row duplicate and single plots planted with a 4-row potato planter on April 12. Plots were 100 feet long and seed was spaced 9 inches apart in 34-inch rows. A 5-10-10 fertilizer was banded at planting at 2400 lbs. per acre and an additional 60 lbs. of nitrogen was sidedressed when the plants were 2-4 inches high. The potatoes were irrigated nine times using 1-1½ inches per application. The potatoes were harvested October 17 after all vines were dead.

Each 2-row plot was divided into two 30-ft. sections at harvest and these yields were calculated separately but not analyzed statistically.

Chippewa produced the highest yield while two seedlings from Fredericton, Canada, F5459 and F5570 produced yields similar to Chippewa. F5459 also had the relatively high specific gravity of 1.083. LaChipper, Avon, and Superior produced total yields similar to Katahdin (New Jersey table 4). Seedlings B5000-18, W639, ND5768-10, and ND5886-2 in unreplicated plots produced good yields. Seven varieties had specific gravity of 1.070 or higher and these will be processed and cooked.

Acknowledgements: Mr. Robert Akeley, USDA, Beltsville, furnished the USDA seedlings and several of the named varieties; Dr. Donald Young, the Canadian seedlings; Dr. Robert Johansen, the North Dakota seedlings; Dr. Robert O'Keefe, the Nebraska seedlings; Ben Picha, the Picha seedlings; Starks Farms, the Wisconsin seedlings and varieties; and Dr. Wilford Mills, the Pennsylvania seedling; and C. A. Powers, the Maine (M) varieties. Dr. Elizabeth Stier, Food Science Department, Rutgers, is conducting the cooking and processing tests. Ed. Morin supervised the french frying tests at Seabrook while Vernon Ichisaka, of Seabrook Farms, and George Rue furnished land and assisted in planting and harvesting the varieties and handled crop cultures. Frank Stellatella and James Styers assisted in planting and harvesting and were in charge of the culture of the test on the Vegetable Research Farm at Rutgers.

New Jersey table 1. Summary 1966 Rutgers University Potato variety trials, Seabrook Farms, Seabrook, New Jersey.

Variety ^{1/}	Yield Per Acre 2/				Specific Gravity ^{3/}	Remarks
	US#1 Cwt.	Total Cwt.	US#1 Pct.	R's Pct.		
B5141-6	261	293	89	7	83	Round, slight russet
B3478-46	259	299	86	9	63	2% growth cracks and knobs
B4829-7	249	280	89	3	59	7% growth cracks and knobs
Chippewa B	243	273	89	8	59	Appearance good
W643	243	273	89	7	58	Appearance good - 2% knobs

continued

New Jersey table 1, continued.

W591	238	269	89	7	67	2% knobs, round slight russet
Katahdin B	230	250	92	5	63	2% knobs and growth cracks
5765-1 P	227	237	96	2	68	Appear.good-1% gr.cr.,round russ.
5814-1 P	223	242	92	5	68	2% knobs-slight russet
B5063-3	220	259	85	10	71	Red, round. 1% knobs
ND6127-10	219	267	82	9	62	Red, round, 5% growth cracks
LaChipper W	217	251	89	7	58	1% knobs--appearance good
B5253-31	214	239	89	7	62	1% knobs--round slight russet
B5031-18	213	239	89	7	77	2% knobs, slight russet
ND5886-2	213	246	87	6	63	5% knobs, round smooth
Hi-Plains N	213	265	80	10	69	6% off-grade, appearance good
W560	210	240	87	9	79	2% knobs & growth cracks, rnd.russ.
77.57-1 N	207	247	84	5	60	8% knobs,oblong,appearance good
B5301-7	206	227	91	5	63	3% knobs & growth cracks
B5267-2	201	251	80	5	70	13% growth cracks and knobs
B4557-2	200	270	74	16	82	4% knobs, poor
58170 P	200	223	90	6	63	2% growth cracks--oblong
B5132-3	198	251	79	5	58	14% " " --round russet
Keswick M	196	215	91	5	68	2% knobs, many with soft rot
B5000-12	195	221	88	7	62	1% knobs, russet
Avon F	195	229	85	8	58	3% knobs, round
Superior W	194	231	84	5	62	9% knobs and growth cracks
B5232-13	194	239	81	6	62	10% " " " "
Kennebec B	193	257	75	10	64	12% " " " "
B5287-16	189	215	88	8	63	1% " " " "

1/ Letters before or after a variety indicate source as follows: B--USDA, Chapman Farm, Maine; F--Canada Dept. of Agr., Fredericton; N--O'Keefe, Nebraska; ND--Johansen, North Dakota; P--Ben Picha, North Dakota; W--Starks Farms, Wisconsin.

2/ Average of 4 replications.

3/ 1.0 omitted from specific gravity.

4/ Average of 3 replicates.

New Jersey table 1, continued.

1L57410-10 B	188	270	66	9	57	21% knobs--red round
6336 F	188	208	90	4	65	5% growth cracks and knobs
1L57410-2 B	186	291	64	16	58	17% knobs--red russet
5302-3 P	184	228	81	8	62	8% knobs, oblong
Cobbler M	181	209	87	4	69	6% knobs--sprouted
B5299-39	181	220	82	7	59	9% knobs and growth cracks
ND5768-10	179	204	88	11	71	Round Russet--good appearance
ND5899-1	178	255	70	10	75	18% knobs--oblong russet
Hunter F	176	217	81	14	67	Round, slight russet
Norgold Rus.M	174	255	68	13	60	13% knobs--long rus.,many soft rot
Grand Falls F	174	241	72	17	64	7% gr.cr.& knobs,oblong sli.russet
B5052-7	170	208	82	18	59	7% knobs.
W563	168	186	90	4	68	3% knobs--scaly, round
B725-61	159	253	63	19	58	1% knobs--very small
F5459	158	199	79	12	80	5% second growth,oblong sli.russet

continued

New Jersey table 1, continued.

F5570	155	216	72	19	68	2% knobs, many soft rot
Haig M	151	184	82	14	66	Small round, scaly
F5247	149	197	76	12	76	9% knobs, round slight russet
B751-119	147	181	81	13	67	Round slight russet
W639	146	228	64	8	69	24% knobs, red stolons adhere to tubers
Morgold						
Russet W	146	223	65	18	54	8% knobs, long russet
Cherokee B	144	283	51	17	65	27% knobs, small
W664	138	178	77	16	70	3% knobs, round russet
B4123-10	135	180	75	11	50	10% knobs, many rotten, discard
Penobscot M	119	169	70	19	76	4% knobs, many sprouted & soft rot
LSD 5%	33					
1%	43					
B4784-1	254 ^{4/}	348	73	15	55	8% knobs, round smooth
B5036-40	236 ^{4/}	296	80	6	61	10% knobs, irregular shape
B5066-3	245 ^{4/}	298	82	7	55	8% growth cracks & knobs, sli. rus.
B5088-7	246 ^{4/}	267	92	5	59	1% second growth, round
B5099-11	269 ^{4/}	316	85	7	56	6% knobs & growth cracks

1/Letters before or after a variety indicate source as follows: B USDA, Maine, F Canada Dept. of Agr., Fredericton, M C.A. Powers, Maine's, ND Johansen, North Dakota, P Ben Picha, North Dakota, W Starks Farms, Wisconsin.

2/Average of four replicates.

3/1.0 omitted from specific gravity.

4/Average three replicates only.

New Jersey table 1A. 1966 potato variety trials, Rutgers, The State University in cooperation with Seabrook Farms, Seabrook, New Jersey.

(20-Hill Plots)				
Variety	Yield Per Acre		Specific Gravity ^{1/}	Remarks
	US#1	US#1		
	Cwt.	Pct.		
B5718-6	351	86	66	Russet, round, medium-large
B5701-4	322	86	55	Slight russet; round-oblong 2% knobs
B5696-3	319	82	55	Russet, round, 7% knobs
B765-1-P	310	97	76	Round, large
B5696-1	304	81	55	Round-oblong, medium size
B814-1-P	299	93	75	Round-oblong, large, 4% growth cracks
B5585-7	298	89	63	Round, good appearance, some sprouts
B5680-1	297	86	68	Round-oblong
B5718-22	279	73	61	Round, 8% growth cracks, knobs 14% B's
B5700-4	270	90	70	Oblong, med.-large, much rhizoctonia
B6129-2	270	84	82	Scaly skin 4% knobs, 10% B's Med. eye
B5585-5	270	87	56	Appearance good, round sli. russet
B5740-2	268	70	56	13% B's, round, smooth
B5635-9	264	81	64	10% knobs, round
B5694-1	259	84	50	Smooth, round
B5712-5	259	86	58	5% knobs & growth cracks
Cobbler	255	79	69	12% knobs & growth cracks
B5698-8	250	89	57	Appearance good, round sli. russet

continued

New Jersey table 1A, continued.

B5696-6	241	88	68	Round sli. russet, med. eye
B5604-1	238	90	65	Round-oblong slight russet
B5700-1	234	82	64	5% knobs, round, slight russet
B5701-2	231	89	62	Round-oblong
B5704-3	225	91	65	Round-slight russet
B5736-3	221	79	56	13% B's, round, sli. russet
B5733-4	217	74	56	10% B's, 15% growth cracks and knobs
B5755-8	215	70	56	15% B's, 12% growth cracks " "
B5690-5	213	85	59	6% knobs & growth cracks, long russet
B5687-12	208	84	55	9% knobs, large round sli. russet
B5675-5	207	82	55	13% B's, 3% growth cracks, scaly skin
B5676-2	197	87	61	5% knobs, round, med.-large
B5696-4	197	90	59	Round-oblong, med. large, good appearance
B5703-5	192	75	61	14% B's, 5% knobs, round, smooth
B5617-5	189	70	56	23% B's stolons adhere to tubers
B5630-1	183	73	62	11% B's, 14% knobs, oblong
B5702-1	182	87	71	10% B's, few sprouted, russet-oblong
B5755-3	182	69	57	19% B's, 15% knobs
B1668-2	182	79	70	Discard 17% B's, small scaly skin
B5598-2	176	69	55	16% B's, 10% knobs, red russet
B5647-8	176	89	69	10% knobs, round, sli. russet
B5691-2	176	89	74	Round, sli. russet, medium size
B5683-5	172	53	67	12% B's, 30% off-grade
B5665-7	171	75	69	15% B's, 5% knobs, smooth
B5593-1	169	83	65	12% B's
B5683-2	169	69	61	24% B's
B5613-1	161	73	57	12% B's, 10% knobs
B5687-9	157	80	78	Russet-oblong, some sprouted
B5701-21	154	71	67	17% B's
B5658-1	154	93	60	-
B5718-16	145	75	64	20% B's
B5699-3	144	66	66	15% knobs
B5701-5	142	48	58	35% growth cracks and knobs
B5598-3	140	74	61	16% B's, red
B5664-4	135	83	72	Round, smooth
B5594-3	128	78	65	
B5669-4	127	85	63	
B5755-7	125	74	73	18% B's
B5716-5	116	72	56	16% B's
B5647-9	113	76	68	20% B's
B5591-1	108	56	76	28% knobs, 13% B's
B5735-5	106	66	60	24% B's

1/ 1.0 omitted from specific gravity

New Jersey table 2. Summary 1966 Rutgers University potato variety trials, Vegetable Research Farm, New Brunswick, New Jersey.

Variety ^{1/}	Yield Per Acre ^{2/}		Specific Gravity ^{3/}		Remarks
	US#1	Total	US#1	B's	
	Cwt.	Cwt.	Pct.	Pct.	
B5141-6	290	325	89	8	89 No off grades, appearance good
B5299-39	281	317	87	7	64 2% growth cracks
1L57410-10	273	213	87	8	57 Red, appearance fair
B5287-16	269	297	90	8	63 Large, smooth, round, oblong
B751-119	268	326	82	14	70 Round, slight russet, poor
Kennebec	266	292	91	5	66 Oblong
B5031-18	255	275	93	5	74 Large, irregular
B5253-31	240	272	88	7	62 2% knobs, appearance good
B3478-46	236	264	93	7	67 Good, none off grade
1L57410-2	235	282	83	12	64 Red, small-medium, poor
B5132-3	231	249	93	5	60 Round russet, medium size
B5090-11	226	268	84	7	56 6% growth cracks, long
B5282-13	224	261	86	8	67 4% growth cracks, oblong, long
B5088-7	222	253	88	9	62 1% growth cracks, appearance gd.
B5036-40	217	245	87	6	61 4% knobs & growth cracks
B5257-2	216	296	73	6	71 20% knobs, poor shape
Chippewa	212	234	91	7	56 Appearance good
Katahdin	208	227	92	6	60 None off grade
B4784-1	198	324	61	14	57 11% growth cracks & knobs, poor
B725-61	194	295	66	19	52 8% growth cracks & knobs, poor
B5063-3	191	220	87	7	73 Red, 4% growth cracks
B5301-7	190	214	89	9	58 None off grade
B5066-3	189	213	89	8	61 Slight russet
B4557-2	187	256	73	17	70 Some knobs, small, poor
B5000-18	184	230	80	15	64 Slight russet, small, poor
B4123-10	168	194	87	11	59 Small, irregular, poor
B5052-7	168	185	91	7	57 Appearance good
B4829-7	147	164	90	8	55 Irregular shape
Cherokee	117	165	71	17	70 7% knobs & growth cracks, poor
LSD 5%	50				

^{1/}All seedlings and named varieties supplied by USDA, from Chapman Farm, Maine.

^{2/}Average of three replications.

^{3/}1.0 omitted from specific gravity.

New Jersey table 3. Summary 1966 Rutgers University potato variety trials, Vegetable Research Farm, New Brunswick, New Jersey.

Variety ^{1/}	Yield Per Acre ^{2/}		Specific Gravity ^{3/}		Remarks
	US#1	Total	US#1	B's	
	Cwt.	Cwt.	Pct.	Pct.	
Chippewa M	276	298	93	6	56 No off grade tubers
77.57-1 N	274	305	90	5	61 3% growth cracks
Kennebec M	272	295	92	3	71 3% knobs
Katahdin M	264	283	93	6	66 No off grade tubers
Penobscot M	250	315	90	6	79 2% knobs, rough
MD5899-1	248	292	85	11	75 Appearance good

continued

New Jersey table 3, continued.

F5247	242	284	85	9	79	3% knobs
W639	240	253	95	4	75	Red, round
Hi-Plains N	239	263	91	7	63	Oblong, appearance good
5765-1 P	230	244	94	3	61	1% growth cracks
Green Mt. M	222	277	80	8	80	9% knobs
Cobbler M	221	248	89	9	62	1% knobs
W560	220	247	86	11	72	3% under 1½", small
ND5886-2	214	252	85	11	59	3% under 1½", small
Superior W	213	232	92	6	69	Round, shallow eyes
LaChipper W	211	249	85	12	67	3% under 1½", small
W591	211	235	90	7	71	Round, slight russet
5302-3 P	199	239	83	8	53	7% jelly rot, long, medium large
F5570	197	256	77	15	58	4% growth cracks & knobs
Keswick M	193	204	95	4	66	Round irregular shape
Grand Falls F	190	245	77	16	62	Oblong, small, medium
Avon F	188	210	90	7	67	Round, smooth
F5459	188	246	82	12	75	2% knobs & growth cracks, oblong
Haig M	183	212	86	11	57	Round Russet type
W643	183	224	82	15	56	Small, round
58170 P	180	199	91	5	57	Long, 2% knobs, light set, poor
5814-R1 P	174	197	89	9	70	Appearance good
Norgold Rus. W	167	208	80	10	65	Long russet, 5% knobs
W563	162	192	84	9	70	Red 5% growth cracks
ND5768-10	147	170	87	11	72	Small, round, slight russet
Hunter F	146	174	84	12	70	Small, round, slight russet
6336 P	131	158	83	12	61	2% growth cracks
Norgold Rus. M	121	161	75	17	58	Small, long russet type
W664	113	155	74	16	76	5% growth cracks
LSD 5%	48					

1/Letters before or after a variety indicate source of seed as follows: F--Fredericton, Canada, M--Maine, N--Nebraska, ND--North Dakota, P--Picha, North Dakota, W--Wisconsin.

2/Average of four replications.

3/1.0 omitted from specific gravity.

New Jersey table 3A. 1966 potato variety trials, Rutgers, The State University Vegetable Research Farm, New Brunswick, New Jersey.

(20-Hill Plots)				
Variety	Yield Per Acre		Specific Gravity ^{1/}	Remarks
	US#1	US#1		
	Cwt.	Pct.		
B5700-1	374	91	64	Large, irregular, round
PA3HS9	343	94	65	Irregular, round-oblong
B5617-5	335	88	72	Poor shape
B5635-9	332	91	54	-
B5690-5	312	84	66	8% knobs & growth cracks
B5700-4	309	87	65	-
B5701-5	307	71	60	24% knobs, long, pear shape
B6129-2	300	83	83	9% B's, round-oblong
B5718-6	290	90	64	Round
B5680-1	282	91	74	Good appearance, round, smooth
B5658-1	281	93	59	Large, irregular, long

continued

New Jersey table 3A, continued.

B5585-7	277	93	64	Round, smooth
B5696-1	274	82	56	9% B's, 8% growth cracks
B5712-5	266	86	56	Oblong, russet
B5598-2	261	93	56	Red, round
B5733-4	259	89	64	2% knobs
B5630-1	255	83	64	Long, irregular
B5704-3	254	87	61	Dark russet skin
B5694-1	253	85	60	10% B's
B5696-3	250	92	59	Good appearance, large, oblong
B5736-3	248	80	72	Round, medium, small
B5699-3	246	84	60	Oblong
B5696-4	239	92	61	Round, oblong, smooth
B5718-16	238	91	70	Round, smooth skin
B5701-4	229	85	60	Round, medium size
B5687-12	229	93	58	Round, russet
B5698-8	223	88	58	Round, smooth, slight scab
B5755-3	222	73	61	20% B's, many pear-shaped
B5585-5	220	88	57	10% B's, oblong
B5665-7	220	92	69	Round, oblong
B5718-22	219	80	60	7% knobs, round
B5740-2	218	68	66	16% growth cracks & lenticel infection
B5696-6	211	90	59	Medium, small
B5691-2	206	80	66	12% B's, round, russet
B5613-1	205	90	64	Oblong, russet, good appearance
B5591-1	203	75	79	13% B's, oblong
B5675-5	201	82	59	8% severe lenticel infection
B5755-8	201	65	57	15% B's, 12% knobs & growth cracks
B5669-4	198	89	70	1% knobs, oblong
B5702-1	193	84	67	Medium-small, smooth
ND6127-10R	191	91	64	Red, round, medium-large
B5701-2*	191	87	69	Large, oblong
B5594-3*	191	83	68	Russet, oblong
B5703-5*	187	65	-	23% knobs, long
B5687-9*	183	72	-	21% knobs, spindly
B5593-1*	174	85	-	10% B's
B5701-21*	172	67	-	16% B's, 12% knobs
B5755-7*	168	65	-	26% B's, 5% growth cracks
B5647-9*	164	71	-	20% B's
B5683-5*	162	58	-	26% B's, 7% knobs
B5716-5*	162	83	-	13% B's
B5664-4*	160	83	-	Oblong
B5598-3*	155	73	-	Pink & 20% B's
ND4957-10*	145	74	-	1% B's, 13% severe lenticel infection
B5647-8*	142	79	-	14% B's

continued

New Jersey table 3A, continued.

B5683-2*	107	57	-	32% B's
B5676-2*	102	81	-	All small
ND5922-12*	79	50	-	25% growth cracks & rot
B5735-5*	69	43	-	44% B's
B5604-1*	68	27	-	55% severe lenticel infection
B1668-2*	33	42	-	42% B's severe wilt

1/1.0 omitted from specific gravity.

* Discard.

New Jersey table 4. George Rue variety trial 1966, Imlaystown, Monmouth County.

Variety	Yield Per Acre		Specific Gravity
	Total	U.S.#1	
	Cwt.	Pct.	
Chippewa M	421	90	60
F5459	400	91	83
F5570	375	90	58
Green Mountain M	359	80	70
Kennebec M	354	94	68
LaChipper W	323	90	65
Katahdin M	323	92	60
Avon F	321	90	63
Superior W	310	91	66
Norgold Russet W	310	75	63
Cobbler M	305	82	67
Grand Falls F	295	80	64
Haig M	292	85	60
F5247	280	85	70
Hunter F	277	84	70
Keswick M	249	90	58
Norgold Russet M	233	75	64
Penobscot M	208	90	72
B5000-18	309**	90	60
W591	278**	90	61
W643	237**	82	56
W560	221**	86	69
W639	405***		68
ND5768-10	339		67
ND5886-2	313		59
W563	303		64
5765-1 P	295		72
W664	272		66
ND5899-1	269		67
5814-1 P	269		71
Hi-Plains N	262		64
77.57-1 N	249		65

* = Average of 4 plots except where noted. ** = Average of 2 plots. *** = One plot only for this and following varieties. B = USDA. F = Fredericton, Canada. M = Maine, N = Nebraska, ND = North Dakota, P = Ben Picha, North Dakota, W = Starks Farms, Wisconsin.

NEW JERSEY

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Cooperative Testing of Potato Varieties

Varieties were grown in replicated tests at five locations in 1966. The locations were as follows: Shirley, New Jersey; Wauseon, Ohio; Racine, Wisconsin; Ebensburg, Pennsylvania; and Presque Isle, Maine.

Planting dates, harvest dates and cultural conditions were similar to those for other potatoes grown by each cooperator. At harvest, potatoes from each plot were bagged separately and shipped to the laboratories at Riverton, New Jersey. After grading and weighing, the potatoes were separated into sub-samples for specific gravity determination and for processing tests prior to and during storage under controlled temperature and humidity.

Methods of processing the potato samples for evaluation in frozen soups were the same as described in the 1963 report.

Translucency is the phenomenon of potato dice appearing glassy or gray when immersed in milk. Lower translucency ratings indicate greater desirability for the products. Retained weights, expressed as percentages, are indicative of the tendency of potato dice to slough on exposure to uniform methods of treatment. Greater retained weights indicate lesser sloughing.

The results of the Maine, New Jersey, Ohio and Wisconsin locations are given in Cunningham tables 1, 2, 3, and 4, respectively.

Samples from the varieties grown at Ebensburg, Pennsylvania and stored at 40 and 45° F. are for processing as french fries and mashed potatoes and subsequent quality evaluation. Yield and specific gravity data are given in Cunningham table 5.

Cunningham table 1. Yield, specific gravity, tuber rating, and retained weight and translucency rating of dice for varieties at Presque Isle, Maine, 1966.

Variety	Yield Per Acre		Tuber Rating ^{1/}	Specific Gravity	Retained Weight ^{2/}	Translucency Rating ^{2/}
	Above 1 7/8"					
	Cwt.	Pct.			Pct.	
B4829-7	339	96	3+	1.082	12.9	5.5
B50C0-18	278	91	3	89	16.7	5.8
B5036-40	400	97	3	96	7.5	5.3
B5066-3	362	96	3+	83	13.4	6.0
B5141-6	261	88	3	114	-	-
B5253-31	276	91	3+	89	34.9	7.8
B5132-3	350	90	3+	92	4.1	7.8
B5282-13	350	93	3	97	7.6	7.3
B5287-16	354	94	3+	83	11.6	7.8
B5301-7	274	89	3	86	22.7	7.0

continued

^{1/} Campbell Institute for Agricultural Research

^{2/} United States Department of Agriculture

Cunningham table 1, continued.

B5281-1	282	84	4	88	8.8	5.0
B5286-24	290	88	4	92	5.5	6.8
B5408-2	337	91	3+	82	9.4	7.8
B5415-6	383	97	3	98	22.9	7.5
B5415-13	272	93	3	93	11.4	7.3
B5421-3	354	96	3	86	13.0	4.8
B5422-6	366	96	3+	91	22.8	6.5
B5422-10	375	94	4	90	18.4	3.5
B5446-4	297	92	3+	83	18.4	6.5
B5458-3	327	97	3+	87	23.7	8.5
B5461-4	323	93	3	90	12.6	5.3
Katahdin	337	95	3	94	12.2	7.0
Kennebec	397	97	3	95	12.4	6.3
Cherokee	289	91	3	99	16.7	6.5
Pennchip	377	95	3	94	18.4	8.8
Norgold Russet	301	86	4	89	10.7	5.8
Keswick	384	97	2+	98	15.1	7.0
B725-61	361	96	3	92	29.7	5.0
B4469-7	272	96	3	108	-	-
Mean	330	93		1.092	15.3	6.5
LSD .05	38			0.004	7.2	1.4
.01	51			0.006	9.5	1.9
C.V.	8.2%			3.6%	33.5%	15.8%

1/ 1 = poor to 5 = excellent

2/ After harvest process; lower translucency rating numbers indicate a more desirable diced product.

Cunningham table 2. Yield, specific gravity, tuber rating, and retained weight and translucency rating of dice for varieties at Shirley, New Jersey, 1966.

Variety	Yield Per Acre Above 2"		Tuber Rating ^{1/}	Specific Gravity	Retained	Translucency
	Cwt.	Pct.			Weight ^{2/}	Rating ^{2/}
					Pct.	
B4829-7	358	93	3	1.060	28.5	6.8
B5000-18	295	84	2+	62	45.0	7.3
B5036-40	274	87	3	63	14.8	4.8
B5066-3	412	89	2	60	25.8	6.3
B5132-3	399	90	3+	59	16.4	7.8
B5141-6	380	84	3	82	-	-
B5253-31	375	90	2+	60	31.1	7.5
B5282-13	342	88	2	69	10.4	7.0
B5287-16	352	93	4	59	38.7	8.8
B5301-7	369	91	3	57	47.9	7.5
B5282-1	263	78	4	55	26.3	4.8
B5286-24	327	83	3+	70	9.8	5.5
B5408-2	413	90	2	64	20.3	7.3
B5415-6	423	91	2+	65	36.3	6.8
B5415-13	311	91	3	62	28.4	7.5
B5421-3	233	71	2+	61	28.6	5.3
B5422-6	408	72	2	66	39.7	6.0
B5422-10	403	80	3	60	34.9	7.0
B5446-4	347	86	3+	61	27.0	5.0
B5458-3	330	94	4+	59	31.6	7.3
B5461-4	318	88	2+	64	23.0	4.3
Katahdin	332	89	3	62	21.2	6.8
Kennebec	399	90	2+	71	31.3	7.3

continued

Cunningham table 2, continued.

Cherokee	265	76	1+	70	32.8	5.0
Plymouth	416	94	3	65	26.0	8.5
Norgold Russet	297	78	3	64	16.6	6.5
B725-61	311	77	2+	55	45.8	5.3
Keswick	349	93	2+	66	38.2	7.0
Mean	350	86		1.063	28.7	6.5
LSD .05	83			0.005	10.5	1.1
.01	110			0.007	13.9	1.4
C.V.	16.8			5.9%	26.0%	12.1

1/ 1 = poor to 5 = excellent

2/ See footnote 2, table 1.

Cunningham table 3. Yield, specific gravity, tuber rating, and retained weight and translucency rating of dice for varieties at Wauseon, Ohio, 1966.

Variety	Yield Per Acre Above 2"		Tuber Rating ^{1/}	Specific Gravity	Retained Weight ^{2/} Pct.	Translucency Rating ^{2/}
	Cwt.	Pct.				
B4829-7	-	-	1+	1.066	29.7	7.3
B5000-18	-	-	2+	70	21.7	7.0
B5036-40	209	91	3+	71	17.8	5.5
B5066-3	230	87	3	64	25.0	7.0
B5132-3	272	92	2	65	14.8	8.0
B5253-31	-	-	2	67	39.7	7.5
B5282-13	194	90	2-	72	20.4	8.0
B5287-16	188	92	1+	61	34.5	9.0
B5301-7	252	92	2+	63	37.9	8.8
B5281-1	170	85	2	59	25.8	5.3
B5408-2	-	-	1+	65	17.7	8.5
B5415-6	273	94	3	73	37.6	8.8
B5415-13	240	92	2	66	29.4	8.3
B5421-3	196	92	3	74	18.3	4.3
B5422-6	-	-	3	72	27.1	7.8
B5422-10	-	-	3	70	32.9	7.3
B5446-4	-	-	2	59	36.5	7.0
B5458-3	-	-	1+	59	38.7	8.3
Katahdin	322	96	3	73	22.1	8.5
Kennebec	254	94	3+	73	30.8	7.8
Cherokee	265	92	2	76	34.9	7.0
Plymouth	267	92	2	76	25.1	9.5
Norgold Russet	183	65	4	66	22.3	6.3
B725-61	268	92	2+	68	42.6	7.3
Mean	237	91		1.068	28.5	7.5
LSD .05	63			0.004	9.7	1.1
.01	84			0.006	12.9	1.4
C.V.	18.7%			4.4%	24.2%	10.2%

1/ 1 = poor to 5 = excellent

2/ See footnote 2, table 1.

Cunningham table 4. Yield, specific gravity, tuber rating, and retained weight and translucency rating of dice for varieties at Racine, Wisconsin, 1966.

Variety	Yield Per Acre		Tuber Rating ^{1/}	Specific Gravity	Retained Weight ^{2/}	Translucency Rating ^{2/}
	Above 1 7/8"					
	Cwt.	Pct.			Pct.	
B4829-7	351	99	1	1.072	36.2	7.4
B5000-18	293	96	2	78	36.8	7.4
B5036-40	374	98	2+	80	24.9	6.0
B5066-3	358	97	3	76	32.9	7.0
B5132-3	398	98	3	73	22.7	8.2
B5253-31	333	98	2+	73	65.7	8.6
B5282-13	395	98	3	86	18.3	7.2
B5287-16	373	98	2	68	59.0	9.0
B5301-7	271	98	3	67	61.7	9.0
B5281-1	273	96	4	65	35.1	7.2
B5286-24	359	98	2	82	26.4	7.6
B5288-5	288	98	3	63	38.4	9.0
B5403-2	323	99	1+	78	19.8	7.6
B5415-6	435	98	3	85	45.7	8.0
B5415-13	272	97	2	68	44.6	7.2
B5421-3	378	99	2	90	23.4	6.6
B5422-6	353	98	2	80	51.3	7.8
B5422-10	409	96	3	76	39.1	8.0
B5446-4	381	98	3	67	47.2	7.4
B5458-3	318	97	2+	69	52.5	7.6
Katahdin	342	99	3	85	27.6	8.6
Kennebec	435	98	2+	87	35.8	8.2
Cherokee	302	98	2	84	43.5	6.6
Plymouth	303	96	2	85	46.6	7.4
Norgold Russet	401	97	3+	84	31.1	7.2
B725-61	420	98	2	80	40.8	7.0
Mean		98		77	38.7	7.6
LSD .05	50			0.004	9.8	1.0
.01	66			0.005	13.0	1.3
C. V.	11.2%			3.86%	20.3%	10.9%

^{1/} 1 = poor to 5 = excellent

^{2/} See footnote 2, table 1.

Cunningham table 5. Yield, specific gravity, and tuber rating for varieties at Ebensburg, Pennsylvania, 1965.

Varieties	Yield Per Acre Above 2"		Tuber Rating ^{1/}	Specific Gravity ^{2/}
	Cwt.	Pct.		
B4784-1	319	97	1	1.068
B5036-40	264	97	2	72
B5042-2	256	96	1	85
B5066-3	275	98	3+	70
B5132-3	312	99	2	65
B5141-6	259	96	3	93
B5253-31	216	98	3+	61
B5282-13	298	98	2+	77
B5287-16	278	98	3+	66
B5299-39	213	96	3	64
B5301-7	172	96	3+	65
B5415-6	283	97	2+	84
B5415-13	158	94	3+	82
B5422-6	259	96	3	77
Russet Rural	263	95	2+	79
B5463-1	200	97	3	72
B5463-15	129	95	3+	66
Katahdin	301	98	2+	79
Kennebec	293	98	2	72
Penobscot	268	99	2-	84
Grand Falls	308	94	1+	80
F5459	254	96	2	96
F5552	225	95	2	88
F5561	245	93	2+	87
F6124	212	93	2	92
Mean	250			1.077
LSD .05	54			.006
.01	72			.009
CV	17.4%			6.00%

^{1/} 1 = poor to 5 = excellent.

^{2/} After 3½ month storage at 40° F.

NEW YORK (Upstate)

E. E. Ewing, O. E. Schultz, and Mia-Soon Lee

As in past years, one variety trial was carried out at the Cornell University Vegetable Research Farm near Freeville. In spite of weekly applications of maneb, a severe infestation of early blight developed late in the season and may have reduced yields. Results from this trial are presented in Upstate New York table 1. Note that varieties are ranked according to U.S. No. 1 yields. Several numbered selections produced yields which compared favorably with that of Katahdin. B5132-3 had the highest No. 1 yield. Tubers had a semi-russet skin, with shallow to medium eyes, and were rather spherical in shape except for occasional deep growth cracks. The specific gravity of this selection was the lowest in the trial.

B5088-7 also had a low specific gravity, but had much more attractive tubers, with shallow eyes, a smooth shape, and white skins. Tubers were round and somewhat flat. About 6% of the total yield was misshapen (mainly due to deep growth cracks) compared to about 2% for Katahdin and 14% for Kennebec.

B5036-40 ranked next in No. 1 yield. Like B5132-3, it had a semi-russet skin which would probably be a disadvantage for fresh market. Eyes were of medium depth and the tuber shape was generally acceptable. This variety showed promise in early chipping tests. It also had a higher specific gravity than Katahdin and Kennebec.

B5036-3 is a red-skinned selection which has also shown promise for chipping, although it sprouts very early in storage. As in the past, the main defect was a tendency for extremely deep indentations at the apical end. This variety had the heaviest tuber set of any in the trial, and the size uniformity was excellent, as was the specific gravity. It may have a place in the chipping trade if the early sprouting and deep apical ends can be tolerated. Judging from our experience in New York, its appearance would probably not make it acceptable for the fresh market.

The Peconic variety, which is resistant to the golden nematode, gave yields similar to Katahdin. Past experience with this variety in New York indicates that compared to Katahdin it develops a heavier tuber set, is a little earlier in maturity, produces tubers somewhat less regular in shape but more uniform in size, and has a higher specific gravity. These relationships held true again in this trial. Peconic has shown considerable merit for chipping.

Other new entries did not perform as well. One-fourth of the B5090-11 tubers were misshapen, mainly due to deep growth cracks. B5066-3 appeared to mature very early, but was subject to growth cracks and shape defects. Pratt's 77 has many desirable qualities if tuber size could be increased and may require wider spacing.

NY3 was present only in guard rows, and was therefore not included in the statistical analyses. It had a higher specific gravity than did any variety in the actual trial and possesses excellent baking quality.

The Wyoming County Trial, conducted with the assistance of the local Cooperative Extension Service, was established primarily to evaluate resistance to verticillium wilt and was planted in a field which had a history of this disease. Wilt defoliation ratings, together with yield and grading data, are presented in Upstate New York table 2. No doubt these ratings are complicated by natural differences in maturity. However, it should be noted that Houma showed little defoliation in spite of its relatively early maturity. Varieties which showed a high incidence of wilt included Superior, B5141-6, 6HS-9, and Kennebec. As in past trials, Ona had the least defoliation. It also produced the highest total and No. 1 yields in the trial. Presumably the long growing season experienced in 1966 favored late maturing varieties such as Ona. Data on storage, cooking, and processing characteristics from potatoes in both trials will be presented in next year's report.

Variety	Yield Per Acre		U.S. No. 1 ^{2/}	Mean Tuber Wt.	Tubers Per Ft. of Row	Vine ^{3/} Maturity	Grade Defects As % Total Yield				Specific gravity ^{4/}	
	U.S.						Sun- burn	Mis- shapen	Over 1 lb.	Under 1 7/8"		
	Total	No. 1 ^{2/}										
	Gwt.	Gwt.	Pct.	Lbs.		Rating	Pct.	Pct.	Pct.	Pct.		
B5132-3	372	329	88	0.31	8.2	6.0	2.6	7.8	0.0	2.7	63	
B5088-7	381	311	82	0.33	8.0	4.3	7.5	5.6	1.7	3.2	65	
B5036-40	374	309	83	0.35	7.3	3.0	3.7	6.7	2.7	3.1	75	
B5063-3	367	300	82	0.25	10.1	3.8	1.3	9.0	0.8	6.1	84	
Peconic	368	297	81	0.32	7.8	3.5	7.5	5.1	1.4	2.8	75	
Katahdin	350	295	84	0.35	6.8	2.0	8.1	2.3	0.5	1.9	70	
B5090-11	421	287	68	0.35	8.3	4.0	14.8	25.6	1.9	5.2	68	
Norgold Russet	314	272	87	0.27	8.0	6.3	0.0	3.2	2.1	6.7	63	
Pratt's 77	321	268	83	0.23	9.8	3.3	1.3	2.0	0.0	13.2	81	
B5066-3	338	265	78	0.33	7.1	7.8	3.6	11.9	1.9	4.0	64	
Kennebec	381	261	65	0.36	7.4	3.0	10.6	13.8	2.1	3.9	71	
R. Burbank	279	152	54	0.40	4.8	2.3	0.9	34.2	3.3	4.2	75	
NY3 (Guard)	332	302	91	0.36	6.4						89	
D.05 (Tukey)	(70)	(83)		(0.7)	(0.7)	2.4					(66)	

1/ Planted May 3; seed pieces 8" apart except R. Burbank 16"; individual plots 2 rows wide, 12½ ft. long; 750 lbs. per acre 10-20-20 applied in bands at planting, 630 lbs per acre 10-20-20 side-dressed on June 6; irrigated 4 times; harvested Sept. 28.

2/ U.S. No. 1 tubers, minimum 1 7/8" diameter, maximum 1 lb., mechanical damage not removed.

3/ Vines rated for maturity, August 25, 1-9: 9 = completely dead, 1 = completely green.

4/ 1.0 omitted from all specific gravity readings.

Upstate New York table 2. Variety trial, Wyoming County, 1966^{1/}

Variety	Yield Per Acre		U.S. 2/		U.S. No. 1		Wilt Defoliation		Grade Defects		As % Total Yield		Specific Gravity 4/
	Total	Cwt.	No. 1 ^{2/}	Cwt.	No. 1	Pct.	Pct. 3/	Pct.	Sun- burn	Mis- shapen	Over 1 lb.	Under 1 7/8"	
Ona	329	293			89	6			4.7	1.7	0.0	4.8	72
6HS-9	304	264			87	75			7.9	0.0	2.1	3.0	-
Pennchip	288	253			88	38			4.9	1.0	0.0	6.3	-
Houma	285	247			87	35			4.3	0.9	0.0	8.2	70
6CX-6	287	245			85	35			8.5	1.2	1.5	3.5	-
Kennebec	266	228			86	71			7.4	0.0	0.7	6.7	64
Viking	234	212			91	51			0.4	2.0	3.8	3.3	63
Monona	229	210			92	53			2.2	2.4	1.7	2.4	68
B5141-6	224	200			89	77			3.7	1.5	0.2	5.5	78
Katahdin	220	195			89	30			2.0	0.0	0.0	9.7	70
Superior	211	187			89	86			1.6	1.9	1.8	6.4	67
D.05 (Tukey)	(117)	(97)				(31)							(14)

1/ Planted May 17; seed pieces 12" apart; plots 20' long, single row; harvested October 6.

2/ U.S. No. 1 tubers, minimum 1 7/8" diameter, maximum 1 lb., mechanical damage not removed.

3/ Wilt defoliation rated September 2 as percentage loss in foliage.

4/ 1.0 omitted from all specific gravity readings.

NEW YORK (Long Island)

R. C. Cetas

Evaluation of Potato Varieties and Selections for Resistance to Early Maturity Wilt on Long Island in 1966

Three tests were conducted to evaluate varieties and selections of potatoes for resistance to early maturity wilt on Long Island. This work was conducted in cooperation with Robert Akeley, USDA, ARS, Crops Research Division, Beltsville, Maryland; L. C. Peterson, Department of Plant Pathology, Cornell University, Ithaca, New York; and Austin Warner, Riverhead, New York.

Materials and Methods

The plots were located on Austin Warner's farm near Riverhead, New York. The Sassafras sandy loam soil was naturally infested with Verticillium dahliae, Fusarium sp. and Pratylenchus sp., the organisms believed to be associated with the early maturity wilt complex on Long Island. Approximately 1900 F₂ generation seedlings were evaluated for resistance in single tuber unit plots varying from 1 to 5 hills each. Forty-three advance selections were evaluated in non-replicated plots which varied from 5 to 25 hills per selection. Twenty varieties and advanced selections were included in the replicated trial. The varieties and advanced selections were arranged at random within each of the 4 replicates. Each plot consisted of 20 hills spaced approximately 9.5 inches apart and the rows were 34 inches apart. The seed pieces were cut and dusted with 7.5% Orthocide (captan) dust during the week of March 28 and were planted the week of April 4. The grower-cooperator marked and fertilized the rows with his potato planter and the seed pieces were planted by hand with a "bell" planter. All cultural practices, including supplemental irrigation, were those employed by the grower.

Observations on plant growth and vine condition were made periodically during the growing season. Between August 4 and 10 all F₂ generation seedlings were rated 1 to 7 for vine condition. All selections and varieties in the non-replicated and in the replicated trial were rated in the same manner on August 10. The rating system used was as follows: 1--plants normal or nearly so, 2--slight wilting and bronzing of the foliage, 3--60 to 90% of the foliage green, 4--40 to 60% of the foliage green, 5--20 to 40% of the foliage green, 6--trace to 20% of the foliage green, and 7--all plants dead. All F₂ generation seedlings with a vine condition of 1, 2, or 3 were harvested between September 1 and 9. The non-replicated and the replicated trials were harvested on September 12. Observations were made on the tubers harvested from the F₂ generation seedlings and only those with satisfactory yield, size, shape and other horticultural characters were selected for future evaluations. All tubers harvested from the non-replicated and from the replicated trials were weighed and then sized on a Boggs grader equipped with a 2-inch screen. Specific gravity readings were made with a potato hydrometer (8-lb. capacity) when sufficient tubers were available. Forty tubers, or all tubers when less than 40 were available, 2 inches or more in diameter from each plot in the replicated trial and from each of the more promising selections in the non-replicated trial were scored for scab, pinkeye and stem-end browning.

The method described by Cetas and Jones in 1962 (P.D.R. 46: 601-605) was used for scoring the tubers for scab and for computing scab indices. Pinkeye was rated as follows: 0--none, 1--trace or confined to the eye, 2--lesions extended beyond eyebrow but had not coalesced with adjacent lesions in the eyes of the apical end, 3--lesions from apical eyes coalesced; and 4--lesions from apical eyes coalesced with lesions from eyes in the middle of the tuber. Stem-end browning was rated on a scale of 0 to 6 as follows: 0--no discoloration, 1--trace of discoloration, 2--1 to 6% of vascular ring discolored, 3--6 to 12% of vascular ring discolored, 4--12 to 25% of vascular ring discolored, 5--25 to 50% of vascular ring discolored, and 6--50% or more of the vascular ring discolored when the tubers were clipped about 1/8 inch above the stolon attachment, and where the vascular ring became more or less parallel to the long axis of the tuber. All variety indices were obtained by dividing the sum of the individual tuber indices by the total number of tubers examined. The vine condition scores, the yield data and the stem-end browning data from the replicated trial were subjected to the analysis of variance. Percentages were converted to equivalent angles (arc sin transformation) and the transformed data were analyzed. Significant differences among means were determined by Duncan's multiple range test. Within each group of means, (Cetas tables 3 and 4), means with the same superscript were not significantly different at the 5% level.

Results

An excellent stand of plants was obtained with all selections and varieties. Under the conditions of these trials, the 9.5-inch spacing between plants was too close. Consequently, several selections and varieties produced a lower percentage of tubers 2 inches or more in diameter than expected (Cetas tables 1 and 3). Environmental conditions were favorable for the development of growth cracks and knobs and a high percentage of the tubers in various selections and varieties developed these defects (Cetas tables 2 and 4). Selections with low vine condition scores were not always those which produced high yields. The combination of a high vine condition score and relatively high yield may be indicative of a resistant variety with early to mid-season maturity. In contrast, the combination of a low vine condition score and low yield may be characteristic of a resistant variety that matures very late. The combination of a high vine condition score, low yield, low specific gravity, and high stem-end browning index indicates that a variety is very susceptible to early maturity wilt.

Approximately 40 F₂ generation seedlings were selected for future evaluations. Of the 43 selections grown in the non-replicated trial, only 12 were considered to have sufficient resistance and other desirable characteristics to warrant future testing. These were B8-38, B5408-2, B5415-6, B5415-13, B5422-10, C16-1, D11-1, D139-5, D141-5, D167-1, and D171-7. Of these, only B5408-2, B5415-6, C16-1, and D167-1 produced 300 or more cwt of tubers per acre. B5415-6 produced 466 cwt of tubers per acre in the replicated variety trial. Other selections and varieties that produced 300 or more cwt per acre were Houma, N. Y.-14, Ontario, B725-61, Ona, Marygold, and N. Y.-16. A low percentage of the tubers of Houma and of Ontario were 2 inches or more in diameter. The tubers of B725-61, Ona, Marygold, and N. Y.-16 had low specific gravity readings. B5415-6, N.Y.-14, B725-61, and N. Y.-16 produced a high percentage of knobby tubers. A large percentage of the N. Y.-16 tubers had growth cracks. More scabby tubers were found in Houma than in the other varieties. A high percentage of the tubers of B725-61 had stem-end browning. The following varieties appeared to be quite susceptible to pinkeye: Marygold, B5253-31, B4829-7, Keswick, B5299-3, B751-19, B5080-17, and Kennebec.

Cetas table 1. Yield and specific gravity of potatoes grown in soils naturally infested with organisms that cause early maturity wilt--1966 (Nonreplicated, 9.5-inch spacing).

Variety or selection	Number of hills	Vine score	Yield Per Acre		Specific gravity ^{1/}
			Total	Over 2"	
B8-38	10	4	Cwt. 258	Pct. 68	79
B10-5	10	5	175	47	61
B19-18	10	6	240	92	60
B19-18A	10	5	157	41	62
B43-21	6	1	231	80	-
B5131-2	25	6	137	57	65
B5408-2	25	7	306	79	60
B5410-26	25	7	122	51	60
B5415-6	25	2	332	90	71
B5415-13	25	7	218	81	71
B5422-6	25	7	184	70	60
B5422-10	25	4	251	69	60
B5433-8	25	7	140	50	60
B5458-6	25	7	144	64	60
B5461-4	25	6	144	59	60
B5463-1	25	7	177	75	-
C16-1	10	5	332	61	68
C37-1	10	3	111	50	-
C66-1	10	7	148	87	-
C84-3	10	4	175	89	61
C86-4	7	3	329	80	60
C87-2	10	4	258	93	64
C89-10	10	3	351	89	60
C94-4	10	5	203	77	65
D9-6	10	6	74	25	-
D11-1	10	3	249	85	65
D29-10	10	6	166	67	60
D35-1	8	6	92	50	-
D40-17	10	7	203	73	61
D44-12	5	7	130	21	-
D58-1	10	6	258	79	73
D73-14	10	7	101	64	-
D73-17	10	7	92	70	-
D88-9	10	3	212	87	60
D100-1	10	3	83	56	-
D101-2	10	7	212	83	60
D102-5	10	6	203	82	60
D103-2	10	5	221	71	60
D139-5	10	2	240	86	62
D141-5	10	6	240	81	60
D144-25	10	7	111	68	-
D167-1	10	4	304	91	67
D171-7	10	5	277	91	60

^{1/} 1.0 omitted from all specific gravity ratings.

Cetas table 2. Percentage of tubers with defects and disease indices of potatoes grown in soils naturally infested with organisms that cause early maturity wilt--1966 (Nonreplicated, 9.5-inch spacing).

Variety or selection	Knobs Pct.	Growth cracks Pct.	Scab		Stem-end browning		Pinkeye	
			Pct.	Index	Pct.	Index	Pct.	Index
B8-38	0	0	0	0	56	1.2	0	0.00
B10-5	0	12	-	-	-	-	-	-
B19-18	5	14	-	-	-	-	-	-
B19-18A	0	0	-	-	-	-	-	-
B45-21	14	38	-	-	-	-	-	-
B5131-2	2	0	-	-	-	-	-	-
B5408-2	4	0	2	0	50	0.8	0	0.00
B5410-26	0	0	-	-	-	-	-	-
B5416-6	8	0	0	0	65	0.4	0	0.00
B5415-13	0	0	0	0	22	0.4	0	0.00
B5422-6	1	0	-	-	-	-	-	-
B5422-10	0	0	0	0	57	1.1	0	0.00
B5433-8	0	0	-	-	-	-	-	-
B5458-6	20	2	-	-	-	-	-	-
B5461-4	0	0	-	-	-	-	-	-
B5463-1	0	0	0	0	77	1.9	35	0.58
C16-1	23	10	3	0	58	1.4	3	0.03
C37-1	45	0	-	-	-	-	-	-
C66-1	0	65	-	-	-	-	-	-
C84-3	6	53	-	-	-	-	-	-
C86-4	11	15	-	-	-	-	-	-
C87-2	28	21	-	-	-	-	-	-
C89-10	2	0	2	0.1	75	2.1	10	0.25
C94-4	0	0	4	0.5	64	1.4	18	0.45
D9-6	0	0	-	-	-	-	-	-
D11-1	0	0	3	0.1	76	1.6	5	0.05
D29-10	0	0	-	-	-	-	-	-
D35-1	0	0	-	-	-	-	-	-
D40-17	0	0	-	-	-	-	-	-
D44-12	0	0	-	-	-	-	-	-
D58-1	0	0	95	7.1	8	0.1	0	0.00
D73-14	0	0	-	-	-	-	-	-
D73-17	0	0	-	-	-	-	-	-
D88-9	34	0	-	-	-	-	-	-
D100-1	0	0	-	-	-	-	-	-
D101-2	3	0	-	-	-	-	-	-
D102-5	0	23	-	-	-	-	-	-
D103-2	3	0	-	-	-	-	-	-
D139-5	3	0	7	0.3	14	0.4	0	0.00
D141-5	0	0	10	0.3	71	1.0	0	0.00
D144-25	0	0	-	-	-	-	-	-
D167-1	0	2	67	2.9	57	0.6	0	0.00
D171-7	0	0	2	0.5	52	0.8	2	2.02

Cetas table 3. Yield and specific gravity of potatoes grown in soils naturally infested with organisms that cause early maturity wilt--1966 (4 replicates, 20 hills, 9.5-inch spacing).

Variety or Selection	Average Vine score	Yield Per Acre		Specific Gravity
		Total	Over 2"	
		Cwt.	Pct.	
B5415-6	2.25 ^{a-c}	466 ⁱ	83.4	69
Houma	2.25 ^{a-c}	371 ^{hi}	59.6	73
N.Y.-14	3.25 ^{b-d}	355 ^{gh}	73.2	73
Ontario	2.00 ^{ab}	353 ^{gh}	49.6	65
B725-61	3.50 ^{cd}	327 ^{f-h}	65.8	60
Ona	1.25 ^a	314 ^{f-h}	75.6	62
Marygold	6.50 ^{fg}	308 ^{e-h}	84.5	60
N.Y.-16	3.00 ^{b-d}	300 ^{e-h}	81.5	60
B5253	6.25 ^{fg}	266 ^{d-g}	65.1	60
B4829	6.50 ^{fg}	265 ^{d-g}	84.2	60
B5063	2.75 ^{bc}	264 ^{d-g}	60.7	72
B4494-6	4.25 ^{de}	256 ^{d-f}	77.5	63
Keswick	7.00 ^g	240 ^{c-f}	69.8	61
B5299-3	6.00 ^{fg}	217 ^{b-e}	76.7	60
B751-19	5.50 ^{ef}	202 ^{b-d}	55.6	66
B5080-17	6.00 ^{fg}	201 ^{b-d}	51.1	60
B1-4	4.25 ^{de}	181 ^{a-d}	74.5	66
Kennebec	6.25 ^{fg}	160 ^{a-c}	61.1	60
B5301-7	7.00 ^g	154 ^{ab}	61.5	60
Norgold	6.50 ^{fg}	113 ^a	26.2	60

¹/1.0 omitted from all specific gravity ratings.

Cetas table 4. Percentage of tubers with defects and disease indices of potatoes grown in soils naturally infested with organisms that cause early maturity wilt (4 replicates, 20 hills, 9.5-inch spacing).

Variety or Selection	Knobs Pct.	Growth cracks Pct.	Scab		Stem-end Browning		Pinkeye	
			Pct.	Index	Pct.	Index	Pct.	Index
B5415-6	9.4	0.2	0.2	0.01	46.0	0.4 ^{ab}	0.0	0.00
Houma	3.7	0.5	9.1	0.4	25.2	0.4 ^{a-c}	0.6	0.01
N.Y.-14	7.9	2.3	0.0	0.0	37.9	0.6 ^{a-c}	0.6	0.02
Ontario	5.0	0.1	0.0	0.0	42.6	1.2 ^{c-f}	0.0	0.00
B725-61	6.9	1.4	0.2	0.02	80.2	2.0 ^{fg}	0.6	0.02
Ona	0.4	0.6	6.1	0.3	25.0	0.6 ^{a-c}	1.9	0.03
Marygold	1.0	0.1	3.5	0.4	66.8	1.8 ^{e-g}	9.4	0.13
N.Y.-16	13.9	10.9	0.2	0.01	51.9	1.1 ^{b-e}	0.0	0.00
B5253-31	0.1	0.1	0.0	0.0	53.8	0.9 ^{a-d}	11.2	0.27
B4829-7	0.1	1.6	1.0	0.1	58.9	2.0 ^{fg}	7.5	0.11
B5063-3	0.5	0.2	0.0	0.0	37.4	0.7 ^{a-c}	0.0	0.00
B4494-6	0.2	0.9	0.0	0.0	15.4	0.2 ^a	1.2	0.01
Keswick	0.1	0.2	5.8	0.4	74.3	1.6 ^{d-g}	11.9	0.22
B5299-3	0.3	1.4	0.9	0.1	23.7	1.6 ^{d-g}	6.9	0.08
B751-19	0.3	0.2	3.1	0.2	92.7	4.2 ⁱ	5.8	0.06
B5080-17	0.5	0.0	0.0	0.0	71.6	2.3 ^{gh}	9.1	0.16
B1-4	4.8	75.3	0.0	0.0	54.4	1.5 ^{d-g}	0.6	0.01
Kennebec	0.5	0.0	0.6	0.1	95.1	3.0 ^h	58.5	1.37
B5301-7	0.0	0.1	0.0	0.0	59.3	1.2 ^{c-f}	0.0	0.00
Norgold	0.0	9.4	0.0	0.0	62.6	1.0 ^{b-e}	0.0	0.00

NEW YORK

R. L. Plaisted and L. C. Peterson

The objective of the crosses made in 1966 and the program of selection remained the same as previously reported--namely, the production of acceptable varieties possessing high tuber solids, freedom from after-cooking darkening and good chipping qualities, coupled with resistance to the golden nematode, scab and verticillium wilt.

In the primary phase of the selection program, 36,000 seedlings were tubered in the greenhouse. Approximately 32,000 seedlings, tubered in the greenhouse in 1965, were grown in the field under unusually dry conditions. About 13,000 selections were made and these will be further reduced on the basis of winter disease and cooking trials. More than 1200 selections were grown in the first 10-hill plots and 260 were saved for further testing.

In the secondary phase of the program, 165 selections were grown in plots replicated 4 times at Ithaca and 50 were saved while, in the first year yield plots at both Riverhead and Ithaca, 54 selections were grown and 15 saved for further testing.

In the third or advanced selection trials, replicated 4 times at Riverhead, Wainscott and Ithaca, 21 selections were tested and 4 saved and elevated to N.Y. numbers (New York table 7).

The N.Y. numbers were tested in regional plots throughout the state--Riverhead, Wainscott, Cutchogue, St. James, Long Island; Ithaca, Gainesville and Elba upstate New York. Summary of their performance is given in New York tables 1-6.

NY-1 was released as a variety called Peconic. It is resistant to the golden nematode. Its yield is essentially the same as Katahdin. Its tubers are uniformly ovoid in shape but of a narrower size range than Katahdin. It is a "heavy-set" variety and under drought conditions will produce small sized tubers. It is somewhat earlier in maturity than Katahdin. Its specific gravity is good and it will produce light chips following reconditioning after storage at 40°.

NY-2 yields well in upstate New York. Its tuber is russeted, has a high specific gravity and a long dormant period. The yield from .3 of an acre was delivered to the Curtice-Burns processing plant in Bergen, New York. It produced a 32% yield increase in flakes over the materials used for a typical run.

NY-3 to be released as the variety Bake King this winter. It is extremely mealy and an excellent baker. It does not yield as much as Katahdin but outyields Russet Burbank.

NY-16 is a high yielding, light red selection. Its principle attributes are its chipping ability and resistance to verticillium wilt.

NY-21 is a full-sib of NY-2. It yields better than NY-2 on Long Island. It has a high specific gravity and produces light colored chips.

NY-24 is resistant to the golden nematode and derives its resistance from Solanum vernei. It is a high yielding clone. Its tubers, in size and shape, as well as, specific gravity are comparable to those of Katahdin.

NY-28 did not yield as well this year as in previous years but its yield has generally been equivalent to that of Katahdin. It is resistant to blight and verticillium wilt. It produces light colored chips.

NY-30 is resistant to the golden nematode. In yield, tuber appearance and specific gravity it is very similar to Katahdin.

NY-31 is resistant to the golden nematode. It, like NY-30, is much like Katahdin.

New York table 1. Yields of advanced selections 2 and 1/4" relative to yield of Katahdin in the same trials.

	<u>Peconic</u>	<u>NY-2</u>	<u>NY-3</u>	<u>NY-16</u>	<u>NY-21</u>	<u>NY-24</u>	<u>NY-28</u>	<u>NY-30</u>	<u>NY-31</u>
<u>1961</u>	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Ithaca	93%	114%	107%	125%					
Riverhead	117	85	106	105					
Wainscott	122								
Cutchogue	108								
Allegany		103							
<u>1962</u>									
Ithaca	113	127	102	132					
Riverhead	99	87	89						
Wainscott	109	104	101						
Allegany	99								
Riverhead(Sawyer)	106								
<u>1963</u>									
Ithaca	106	112	94	106	99%	107%	135%	115%	113%
Riverhead				101	107	146	110	117	130
Wainscott (12")	109	90	70	129					
Riverhead(Sawyer)	99								
Steuben	123								
Elba		117	87						
<u>1964</u>									
Ithaca	93	95	82	102	98	123	115	113	110
Riverhead	90	74	67		96	67	76	103	126
Wainscott	87	83	67	105	85	161			
Allegany	94	111	81	120					
Wyoming	104			120					
Elba	87	88	83	113					
Oneida	121								
Steuben	103			135					
<u>1965</u>									
Ithaca	111	113	99	114	103	115	106	126	98
Riverhead	82	81			95	104	95	127	113
Wainscott	79	77	78	90	88	110	100	121	98
Elba	119	83		117					
Wyoming	100	105		108					
Allegany	72	121	98	107	98	101			

continued

New York table 1, continued.

1966									
Ithaca	98	110	76	92	93	107	106	102	93
Riverhead	112		94	104	97	125	86	114	112
Wainscott	105		91		91		87	124	119
Elba		85	80		82				
Wyoming	99		104	103	99				
Cutchogue	119					122			
St. James	112					111			

New York table 2. Summary of yield of tubers $2\frac{1}{2}''$ of advanced selections.

Selection	Upstate		Long Island	
	No. of Trials	Average ^{1/} Index	No. of Trials	Average ^{1/} Index
Peconic	17	102	16	103
NY-2	14	105	8	81
NY-3	12	91	9	83
NY-16	14	114	6	101
NY-21	7	96	8	95
NY-24	5	111	9	115
NY-28	4	116	6	92
NY-30	4	114	6	118
NY-31	4	103	6	116

^{1/} Average index is the average of the indices for all locations computed by dividing the yield of the selection by the yield of Katahdin in the same trial.

New York table 3. Riverhead variety trial, 1966.

Selection	Early Planting		Late Planting	
	US #1 Cwt/A	2-3 1/2" Cwt/A	US #1 Cwt/A	2-3 1/2" Cwt/A
Katahdin	410	290	366	263
Russet Burbank	374	300	334	296
Norgold Russet	355	329	354	334
Peconic	438	342	426	395
NY-3	385	346		
6	473	403	367	340
16	440	333	370	241
20	461	330	393	314
21	395	286	360	288
24	471	317	491	358
25	423	336	403	350
B4494-6	400	269	285	234
LSD .05	74	56	58	48

New York table 4. Golden Nematode resistant variety trial. (Plots 2 rows wide x 25' long).

Clone	Average of Three Locations					Yield Per Acre ($> 2\frac{1}{2}$ ")			
	$> 2\frac{1}{2}$ "	$> 2\frac{1}{2}$ "		Green	Over-	Cutchogue	St. James	Wainscott	Average
		Mis-	Growth						
		shapen	crack						
	Pct.	Pct.	Pct.	Pct.	Pct.	Cwt.	Cwt.	Cwt.	Cwt.
Katahdin	9" 84	1.0	.2	1.9	3.2	354	307	328	330
	12" 81	1.1	.1	2.1	7.4	383	255	284	307 319
Peconic	9" 77	1.1	.6	2.7	3.4	441	345	267	351
	12" 80	.2	0	.2	5.3	386	302	278	322 337
NY-6	9" 75	10.0	1.6	.7	.5	426	241	276	314
	12" 78	6.4	3.0	2.0	1.9	423	261	328	337 326
NY-24	9" 76	4.7	1.2	1.8	4.8	441	305	249	332
	12" 78	4.4	.5	1.3	6.4	296	302	290	296 314
NY-25	9" 68	3.0	.9	2.0	1.2	296	215	235	249
	12" 73	3.7	.9	1.0	.6	336	252	249	279 264
B4494-6	9" 78	7.8	.8	.5	3.0	389	252	316	319
	12" 77	10.3	.5	.8	5.5	365	206	281	284 302

Clone	Spacing	Total Yield Per Acre			
		Cutchogue	St. James	Wainscott	Average
		Cwt.	Cwt.	Cwt.	Cwt.
Katahdin	9"	406	360	409	392
	12"	452	310	371	378 385
Peconic	9"	545	403	423	457
	12"	467	345	394	402 430
NY-6	9"	499	339	412	417
	12"	551	339	403	431 424
NY-24	9"	566	374	371	437
	12"	383	363	394	380 409
NY-25	9"	414	316	371	367
	12"	447	323	383	384 376
B4494-6	9"	478	348	397	408
	12"	481	284	342	369 389

Ithaca, N.Y.
4 Replications of 20' Plots 10" Spacing

Selection	Yield Per Acre		Ave. #Tubers 2 1/2' per Hill	Ave. Wt. / Tuber	2 1/2'		No. of H.H. / Ovst. Tubers		S.G.
	Total > 2 1/2'	Cwt. Pct.			Lbs.	Pct.	Green	Pct.	
Katahdin (entered twice)	437	384 88	7.4	.60	.7	.3	3.4	6/49	1.073
Russet Burbank	429	253 66	7.0	.46	9.5	5.0	0		1.084
Peconic	431	376 87	9.1	.47	1.2	0	.4		1.077
NY-2	455	423 93	8.6	.57	0	.2	0	4/18	1.081
NY-3	340	292 86	6.8	.49	.7	.7	0	1/1	1.082
NY-6	446	384 86	8.7	.50	.9	6.8	.1	9/5	
NY-16	448	352 79	6.8	.59	2.6	13.0	.2	3/28	1.065
NY-20	473	402 85	8.9	.52	.9	1.7	1.4	6/28	
NY-21	398	358 90	6.9	.59	0	.5	.3	22/23	1.084
NY-24	464	412 89	7.8	.60	.4	1.9	.2	10/33	1.075
NY-25	442	379 86	8.6	.51	2.3	1.2	.5	0/17	
34494-6	399	337 84	7.1	.54	.8	6.8	0	10/19	
LSD .05	64	61	1.2						

Elba, N.Y.
Plots 18' x 2 Rows 9" Spacing

Selection	Yield Per Acre		Ave. #Tubers 2 1/2' per Hill	Ave. Wt. / Tuber	2 1/2'		S.G.	
	Total > 2 1/2'	Cwt. Pct.			Lbs.	Pct.	Green	Pct.
Katahdin	289	234 81	4.9	.50	.2	.2		1.077
R. B.	245	134 55	3.5	.40			15.2	1.082
NY-2	246	198 80	3.9	.53	.3	.3		1.085
NY-3	265	187 71	3.8	.52	1.3	1.3	.9	1.089
NY-21	233	193 83	3.6	.56	.4	.4	2.0	1.086

continued

Table 5, continued.

Gainesville, N.Y.
Plots 18' x 2 Rows 9" Spacing

Selection	Yield Per Acre		Ave. #Tubers per Hill	Ave. Wt. / Tuber		> 2½		Green Misshapen		G.C.	Pct.	No. HH/Ovsz Tubers	S.G.
	Cwt.	Pct.		Lbs.	Pct.	Pct.	Pct.	Pct.	Pct.				
Katahdin	399	351	88	6.4	.57	2.0	.2					9/20	1.074
Russet Rural	428	367	86	6.9	.55					4.0		8/20	1.078
R. B.	392	289	74	4.9	.60			11.5				1/20	1.083
Peconic	423	348	82	6.3	.58	2.4	.4	.5				0/20	1.078
NY-3	404	365	90	6.8	.56							0/20	1.083
NY-16	404	363	90	5.5	.68			1.9		1.8		10/20	1.066
NY-21	386	348	90	5.7	.63			.4		1.5		6/20	1.086

Mainscott, N.Y.

Plots 18' x 9" Spacing 2 Rows

Selection	Yield Per Acre		Ave. #Tubers per Hill	Ave. Wt. / Tuber		> 2½		Misshapen		Gr	Cr	Green	Pct.	No. of HH/ Ovsz Tuber	S.G.
	Cwt.	Pct.		Lbs.	Pct.	Pct.	Pct.	Pct.	Pct.						
Katahdin	394	300	76	5.4	.58			0		0		.5		0/12	1.073
Russet Burbank	326	179	55	3.3	.56			16.1		0		0		0/4	1.083
NY-3	330	232	70	4.7	.51			0		0		0		0/5	1.086
NY-20	386	269	70	5.4	.51			2.8		0		.9		0/4	
NY-21	368	272	74	4.9	.57			1.4		.9		.8		0/8	1.091
LSD .05	49	89		.6											

New York table 7. Selected clones from third stage of selection, 4 replications of 15' plots, 10" spacing in Ithaca and Riverhead, 9" spacing in South Fork.

Ithaca 1966												
Selection	Yield Per Acre		Ave.No. Ave.Wt.		Some- what Rough	S.G.		No Comment		HH/ Ovsz		
	Total > 2 1/4 > 2 1/4		Tubers Per 2 1/4/Hill Tuber			Tuber		Nice				
	Cwt.	Pct.	Cwt.	Pct.		Lbs.		Very Nice	HH/ Ovsz			
Katahdin	489	471	96	4.1		.66	1.074	6	3	4/38		
C35-1	484	437	90	4.5		.56	1.081	1	2	2/11		
C66-1	426	400	94	3.4		.66	1.073	2	1	4/17		
								1	1	G N		
C100-6	544	512	94	4.9		.60	1.064	1	2	0/11		
C111-21	483	476	99	3.8		.71	1.083	4	6/16	G N		
South Fork 1966												
Selection	Yield Per Acre		Ave.No. Ave.Wt.		Some- what Rough	S.G.		No Comment		HH/ Ovsz		
	Total > 2 1/4 > 2 1/4		Tubers Per 2 1/4/Hill Tuber			Tuber		Nice				
	Cwt.	Pct.	Cwt.	Pct.		Lbs.		Very Nice	HH/ Ovsz			
Katahdin	419	344	82	4.5		.55		2	10			
C35-1	452	314	69	3.8		.54		2	2			
C66-1	393	342	87	4.8		.72		2	2			
C100-6	431	335	78	4.3	1	.59		2	1			
C111-21	333	228	68	3.8		.53		1	2			
Riverhead 1966												
Selection	Yield Per Acre		Ave.No. Ave.Wt.		Some- what Rough	S.G.		No Comment		HH/ Ovsz		
	Total > 2 1/4 > 2 1/4		Tubers Per 2 1/4/Hill Tuber			Tuber		Nice				
	Cwt.	Pct.	Cwt.	Pct.		Lbs.		Very Nice	HH/ Ovsz			
Katahdin	495	424	86	4.9		.50		2	5	0/3		
C35-1	466	379	81	5.2		.42		3	1	0/1		
C66-1	465	413	89	3.8	1	.62		2	1	1/1		
C100-6	538	462	86	5.2		.47		3	1			
C111-21	422	369	87	3.9		.54		1	2	0/3		

NEW YORK (Long Island)
S. L. Dallyn

Long Island Potato Variety Trials

Early Planting Trial

METHODS

Planted April 1, 1966; 10" spacing with assist-feed planter.
Fertilized with 2920 lbs/A 6-12-6 plus 35 lbs. N sidedressed May 24, plus 40 lbs. N topdressed on rye cover crop the previous fall.
Irrigated to provide 1" moisture per week.
Plots 1 row by 30' long.
Design--randomized block, five replications.
Vines killed September 6.

RESULTS

Yield figures are given in Dallyn table 1.

REMARKS

Teton, a round white has been one of the top yielders for the past three years. Keswick continued to look good as an early variety. It is blocky in shape with fairly deep eyes. Peconic is the first Golden Nematode-resistant variety released by Cornell University. It was slightly earlier than Katahdin, had good appearance and set well, thereby giving a high percentage in the 2-3½" range. Superior--midseason, moderately deep eyes, scab-resistant. N.Y. 3, another Cornell release under the name of Bake King, is suitable for baking but not boiling.

Dallyn table 1. Yield results from early planting potato variety trial, Long Island, 1966.

Variety	Yield Per Acre			Variety	Yield Per Acre		
	U.S.#1	2-3½"	2-3½"		U.S.#1	2-3½"	2-3½"
	Cwt.	Cwt.	Pct.		Cwt.	Cwt.	Pct.
B5415-6	491	321	65	Katahdin ^{1/}	403	293	72
Teton	478	362	75	Chippewa	402	269	66
N.Y. 6	473	403	85	B4994-6	400	287	71
N.Y. 24	471	317	67	B4494-6	399	252	63
N.Y. 20	461	330	71	N.Y. 21	395	286	72
Kennebec	446	357	80	Platte	387	361	93
Keswick	441	296	67	N.Y. 3	385	346	89
N.Y. 16	440	333	75	B4829-7	384	298	77
N.Y.1 (Peconic)	438	342	78	LaChipper	375	317	84
Superior	435	352	80	B751-119	375	335	89
N.Y. 25	423	336	79	Russet Burbank	374	300	80
B725-61	422	369	87	Chinook	365	326	89
Irish Cobbler	421	373	88	Norgold	355	329	92
Katahdin	417	286	68	Ona (Utah)	332	287	86
Green Mountain	414	336	81	B5459-7	330	313	94
LaChipper 1/	414	374	90	Ona 1/	249	213	85
B5299-3	410	330	80	B5301-7	249	239	95
High Plains	404	345	85	Ona (Minnesota)	217	186	85

1/ USDA

Late Planting Trial

METHODS

Planted April 22, 1966; 10" spacing with assist-feed planter.
Fertilized with 2920 lbs/A 6-12-6 plus 35 lbs. N May 24, plus 40 lbs. N the previous fall on cover crop.
Irrigated to provide 1" moisture per week.
Plots 1 row by 30' long; randomized block, six replications.
Vines killed September 12.

RESULTS

Yield figures are given in Dallyn table 2.

Dallyn table 2. Yield results from late planting potato variety trial, Long Island, 1966.

Variety	Yield Per Acre			Variety	Yield Per Acre		
	U.S.#1	2-3 $\frac{1}{2}$ "	2-3 $\frac{1}{2}$ "		U.S.#1	2-3 $\frac{1}{2}$ "	2-3 $\frac{1}{2}$ "
	Cwt.	Cwt.	Pct.		Cwt.	Cwt.	Pct.
N.Y. 24	491	358	72	N.Y. 16	370	241	65
Teton	460	409	88	N.Y. 6	367	340	92
Green Mountain	447	352	78	Cobbler	364	330	90
Kennebec	439	363	82	Superior	363	344	94
N.Y.1 (Peconic)	426	395	92	N.Y. 21	360	288	80
B5415-6	418	323	77	Katahdin	358	239	66
Keswick	414	337	81	Norgold	354	334	94
B725-61	404	388	96	Ona (Minn.)	353	287	81
N.Y. 25	403	350	86	R. Burbank	334	296	88
Ona (Utah)	401	354	88	Ona (N.Y.)	328	296	90
N.Y. 20	393	314	79	Ona $\frac{1}{2}$	325	278	85
Chippewa	393	317	80	B 4994-6	291	236	81
B5299-3	381	339	88	B4829-7	279	246	88
LaChipper $\frac{1}{2}$	378	354	93	B4494-6	278	231	83
Katahdin $\frac{1}{2}$	374	287	76	B5459-7	242	238	98
B751-119	370	351	94	B5301-7	226	219	96

$\frac{1}{2}$ / USDA

Dallyn table 3. Storage and quality results from the 1965 trials reported in the thirty-sixth Annual Report (page 134).

Variety	Shrink	Sprout	$\frac{1}{2}$ /		Agtron	Cooking		S.E.
			Specific	Black		Color	Tex.	
	Pct.	Pct.	Gravity	Spot	Chip			
					Color			
Kennebec	4.0	4.3	78	24	34	52	6.2	4.4
Onaway	3.4	5.7	74	20	28	49	6.0	5.4
Teton	3.3	6.8	73	34	33	51	5.2	6.0
Marygold	4.4	12.6	71	26	28	51	4.8	4.2
Katahdin	4.7	8.2	81	29	35	53	5.4	5.4

continued

Dallyn table 3 continued.

Keswick	3.8	7.0	79	28	26	52	4.6	5.4
B3478-45	3.4	4.2	76	24	31	56	5.4	6.8
R. Burbank	3.3	4.0	83	24	33	52	6.8	4.0
Ona	6.0	10.8	76	46	33	49	5.8	3.6
Pennchip	3.8	5.5	78	36	33	51	5.8	6.2
Allehanna	4.5	11.8	66	20	28	47	4.0	4.2
B751-119	6.4	15.0	84	32	40	52	5.6	5.0
Shoshoni	2.8	2.9	72	22	19	54	5.4	4.2
Cobbler	4.8	15.3	71	21	32	52	5.0	4.8
Green Mountain	4.0	9.9	78	30	25	54	5.4	5.4
Norgold	5.9	26.0	72	24	30	52	3.6	4.8
LSD .01	1.8	11.6	08	23	7.3	5	2.1	2.0

1/ 1.0 omitted from specific gravity values.

NIGERIA

Dale R. Suchomel, Kenneth Kopf, and R. V. Akeley

The potato program for Nigeria emphasizes the introduction and development of potato varieties which have resistance to the two most common diseases, early blight (Alternaria solani) and late blight (Phytophthora infestans), and to the root knot nematode.

The U.S. Department of Agriculture National Potato Program supplied 40 advanced breeding selections, 5 named varieties and 9 segregating family lines for disease resistance trials in Nigeria in 1965. The material was planted at two locations. Riyom and Batura, on the Jos Plateau in Northern Nigeria.

In 1966, 14 of the best performing clones were tested in replicated trials at Makeri, Batura, Bakkos, Ganawuri and Riyom. Selections from seedling family B6377 were planted at Ta Hoss in continuing tests for nematode resistance. This was the third consecutive crop on a field badly infested with nematodes.

The results are reported in Nigeria tables 1 and 2. The Jos Plateau area (3500 to 5000 feet altitude) in Nigeria appears to be an excellent area for testing resistance to various potato pests because of their consistent occurrence.

All of the selections in Nigeria table 2 have shown resistance to Phytophthora infestans and some have shown a high degree of tolerance to Alternaria solani. The selections from the family line B6377 have been planted in areas heavily infested with root knot nematode and apparently are highly resistant to nematode attack.

Kennebec, B5090-11, B6376-1R and B6376-11 have thus far displayed the most consistent behavior where they have been planted to date in Nigeria. The 1967 trials will be expanded to test adaptability and disease responses at various locations of lower altitude.

Nigeria table 1. Yield, specific gravity, maturity and reactions to early blight, late blight and root knot nematode of clones grown at Batura, Nigeria, 1965 and 1966.

Clone	Yield Per Acre				Specific Gravity 1965	1/ 1965	Gravity 1966	Maturity 1966	3/ 1966		2/ 1966		2/3/ 1966	
	Total		Over 2 inches						Early Blight		Late Blight		Nematode	
	1965	1966	1965	1966					1965	1966	1965	1966	1965	1966
	Gwt.	Gwt.	Pct.	Pct.										
Ona	93	93	38	19	84		62	L	4		2		2	
Kennebec	111	110	57	39	78		73	M	4		1		4	
Merrimack	73	70	52	39	77		66	M	4		1		2	
B5000-18	63	65	38	43	62		62	E	5		1		2	
B5052-7	82	90	56	61	62		67	M	3		1		2	
B5052-14	70	82	39	55	67		59	M	5		1		3	
B5066-3	89	113	62	31	65		69	E	5		1		2	
B5088-7	55	68	66	37	60		65	M	4		1		3	
B5089-17	85	75	50	40	65		60	L	2		1		4	
B5090-11	92	117	65	67	62		61	L	3		1		4	
B5141-6	56	83	47	58	95		80	M	5		1		3	
Dt5997-1R	60	105	45	38	59		63	M	3		1		2	
Dt6063-1R	63	47	65	22	81		74	M	4		1		4	
B4841-B	-	-	-	-	68		60	M	4		1		3	
Pimpernel	-	-	-	-	87		84	VL	4		3		5	
Majestic	-	-	-	-	-		56	M	4		5		-	
McIntosh	-	-	-	-	-		60	M	4		5		-	
Spartaan	-	-	-	-	-		70	L	4		4		-	
Multa	-	-	-	-	-		70	L	4		4		-	
B6376-1R	-	-	-	-	-		60	M	2		1		-	
B6376-11	-	-	-	-	-		60	E	2		1		-	

1/ 1.0 omitted from specific gravity readings.

2/ 1 = highly resistant to, 5 = completely susceptible.

3/ Nematode resistance data taken at Ganawuri.

Nigeria table 2. Maturity, and index scores for early blight, late blight and root knot nematode of selections grown at Batura, Nigeria, 1966.

Family No.	Selection Number	No. Clones Selected 1965	Maturity	Index Scores ^{1/}			Parentage
				Early Blight 1966	Late Blight 1966	Root Knot Nematode 1966	
B6329		9					Ac26103xB3139-24
	1		E	2	1	1	
B6330		7					Ac26103xB4987-34
B6333		2					B2969-15xMerrimack
B6337		10					
	1		M	3	1	2	
B6343		12					B5023-44xAc26351
	1		E	2	1	1	
B6347		3					B5052-7xMerrimack
	n1		L	1	1	2	
B6376		23					TL1859xISO-1
	1r		M	2	1	3	
	2		E	2	1	2	
	3		M	2	1	2	
	11		E	2	1	1	
B6377		27					NUX-3xB4312-4
	8		M	2	1	2	
	11		L	2	1	1	
	12		L	2	1	1	
B6378		2					B4312-4 x Cherokee
	1		L	1	1	1	

^{1/} See footnote 2, table 1.

NORTH CAROLINA

F. L. Haynes

The breeding program continues to emphasize the development of early maturing varieties for the Coastal Plain, the area of production for late spring--early summer harvest. Chipping quality has become a major objective since more than half the acreage is now contracted to production for chip manufacture.

Weather was very unfavorable during most of the season throughout the area. In the early season excessive rainfall was experienced. This contributed to poor stands in some locations. For a period of six weeks in midseason there was a drought, and then rainfall was again excessively heavy in the period immediately preceding harvest.

Advanced trials of breeding lines were conducted at three locations in the early commercial area. One trial, the Beaufort County planting, was lost to flooding in June. The results of the surviving two trials are presented in N.C. tables 1 and 2.

A new (for this program) experimental design was used for the breeding line trials. This design, an augmented randomized complete block design (see Federer, W. T., Augmented, or Hoonuiaki, Designs. The Hawaiian Planters' Record Vol. LV:191-208. 1956) permits the comparison of quantitative data from clones at an earlier stage in the program. The design looked promising on the basis of this one year's results.

Variety trials were conducted at two locations. The results are presented in N.C. table 3. The variety LaChipper continued its high level of performance as an early variety.

North Carolina table 1. Potato performance trial at Belcross. Plots 1/196 acre, 3 replications. 16 varieties X 3 replications plus 24 varieties in augmented design. Planted 3/11/66, harvested 6/30/66 (110 days). Spacing: 10-inch hills, 40-inch rows. Fertilized 2700 lb/A. 8-8-8.

Variety	Yield U.S.#1		Specific Gravity	Appearance ^{1/}	Chip Color ^{2/}	Maturity
	Per Acre Cwt.	Percent				
55C12-3	382	91	1.061	5	7.4	Early
62C10-2	308	91	75	5	6.6	Med. early
58C20-8	291	85	64	5	6.4	Early
Pungo	286	93	74	4	4.7	Midseason
54W14-1	286	92	79	5	4.9	Med. early
55C13-3	282	88	73	4	5.1	Early
62C2-41	275	88	80	3	5.6	Med. early
58C12-2	268	87	74	4	3.6	Med. early
62C11-1	267	86	84	5	3.6	Med. early
50E33-3	260	91	69	5	4.1	Early
56C18-10	260	86	70	5	1.6	Early
Cobbler	238	88	75	3	4.9	Med. early

continued

North Carolina table 1, continued.

62C7-5	235	88	71	4	5.1	Midseason
62C5-21	230	82	80	4	3.4	Med. early
Katahdin	225	86	69	4	4.6	Med. late
62C2-31	193	87	80	3	2.9	Midseason

Augmented entries - Rep. 1 - adjusted yields

62C4-6	308	91	1.075	4	5.6	Early
62C4-63	302	94	64	5	5.4	Early
64C5-12	280	88	67	4	5.9	Med. early
IL333-WV2	231	85	72	5	3.7	Early
Pennchip	218	85	76	3	3.6	Med. late
Superior	208	85	74	5	2.3	Med. early
64C4-3	188	68	75	5	2.0	Early
59B2-23	120	79	68	5	4.7	Early

Augmented entries - Rep. 2 - adjusted yields

62C5-1	328	93	1.073	5	6.8	Early
62C3-6	295	91	66	5	4.7	Med. early
64C2-6	289	94	71	5	4.9	Med. early
62C2-47	263	91	80	5	5.4	Med. early
55C13-6	234	92	68	4	7.8	Midseason
62C4-90	232	88	76	5	3.4	Early
64C3-7	189	88	74	4	6.1	Med. early
62C1-5	142	83	67	5	3.6	Early

Augmented entries - Rep. 3 - adjusted yields

LaChipper	329	93	1.068	5	3.7	Med. early
64C2-4	296	89	68	5	3.1	Early
64C5-2	292	91	74	4	3.9	Med. early
64C2-15	274	89	72	5	4.0	Early
64C5-8	237	81	69	5	5.0	Med. early
64C4-4	168	74	77	4	5.9	Med. early
59C15-1	158	87	63	5	4.7	Early
64C3-1	156	70	85	5	4.0	Early

LSD (.05) Rep. Entries (RE), Augmented Entries (AE)

RE	45	4
AE same Rep.	78	6
AE dif. Rep.	81	6
AE vs. RE	66	5

- 1/ Tuber Appearance: 1 Very poor; 2 Poor; 3 Fair; 4 Good; 5 Excellent
 2/ Chip color determined by Wise Potato Chip Company, Berwick, Pennsylvania.
 Average of 6 samples, 1 per week for 6 weeks following harvest.
 1-4 Acceptable, with Grade 1 = perfect; 5 Usable but not desirable.
 6-14 Unacceptable, with Grade 14 = black.

North Carolina table 2. Potato performance trial at Columbia. Plots 1/196 acre, 3 replications. 16 varieties X 3 replications plus 24 varieties in augmented design. Planted 3/18/66, harvested 7/1/66 (105 days). Spacings: 10-inch hills, 40-inch rows. Fertilized 2600 lb/A. 5-10-10.

Variety	Yield U.S.#1		Specific Gravity	Appearance ^{1/}	Chip Color ^{2/}	Maturity
	Cwt.	Percent				
55C12-3	235	84	1.061	5	7.7	Early
62C8-6	230	80	66	5	5.0	Early
62C7-5	221	84	71	5	6.0	Med. early
58C20-8	211	80	59	5	6.4	Early
Pungo	207	83	75	4	4.0	Midseason
56C18-10	198	85	65	5	3.1	Early
11333-WV2	195	81	66	5	3.0	Early
62C10-2	187	84	74	5	7.0	Early
55C13-3	187	81	68	4	5.7	Early
62C6-9	181	80	70	5	3.4	Early
Katahdin	170	78	66	4	4.9	Med. late
58C19-2	166	81	72	4	2.6	Early
62C5-21	165	73	75	5	4.1	Early
50B33-3	153	76	65	4	5.1	Early
54W14-1	151	80	80	4	5.1	Early
Cobbler	126	74	74	2	4.3	Med. early

Augmented entries - Rep. 1 - adjusted yields

62C7-11	221	87	1.070	4	8.0	Midseason
Viking	217	75	65	5	3.7	Early
64C2-3	202	83	71	4	3.1	Midseason
Snowflake	201	78	66	5	5.3	Early
64C2-15	197	82	60	5	5.1	Early
LaChipper	175	84	68	4	2.7	Med. early
64C1-13	161	73	76	5	4.7	Early
64C3-1	152	74	83	5	3.7	Early

Augmented entries - Rep. 2 - adjusted yields

62C7-30	228	88	1.069	5	5.9	Med. early
62C6-5	215	89	66	4	5.3	Med. early
64C5-2	213	85	67	5	3.9	Early
64C1-8	197	87	73	5	5.6	Med. early
64C1-7	179	79	72	5	2.4	Early
Superior	175	77	67	5	2.3	Early
62C6-13	149	76	78	5	2.1	Early
64C4-3	101	55	69	5	3.4	Early

Augmented entries - Rep. 3 - adjusted yields

64C2-6	220	77	1.069	4	3.3	Med. late
64C2-4	193	81	57	4	4.0	Early
62C6-2	145	83	78	4	4.9	Early
64C5-8	143	77	69	5	4.9	Early

continued

North Carolina table 2, continued.

64C5-12	142	67	71	4	4.6	Med. early
64C3-7	135	75	80	4	5.1	Midseason
62C6-18	125	74	70	4	4.6	Med. early
64C4-4	109	61	74	5	4.7	Early

LSD (.05) Rep. Entries (RE), Augmented Entries (AE)

RE	25	6
AE same Rep.	44	10
AE dif. Rep.	45	10
AE vs. RE	37	8

1/ See footnote 1, table 1.

2/ See footnote 2, table 1.

North Carolina table 3. Performance of potato varieties grown at Beaufort and Camden, North Carolina. Plots 1/196 acre, 4 replications in randomized block design. Planted 3/12/66. Spacing: 10-inch hills. Fertilized: Beaufort, 2500 lb/A 6-12-12; Camden, 3000 lb/A 5-10-10.

Variety	Beaufort			Camden			Maturity
	Yields US#1	Per A.	Specific	Yields US#1	Per A.	Specific	
	Cwt.	Pct.	Gravity	Cwt.	Pct.	Gravity	
Pungo	292	92	1.069	303	87	1.073	Midseason
LaChipper	247	90	62	258	86	65	Early
Platte	237	91	57	218	82	60	Midseason
Viking	235	93	57	199	77	62	Med.early
54W14-1	226	91	76	210	87	76	Med.early
Penobscot	210	90	73	240	90	77	Midseason
Superior	206	91	62	220	85	65	Early
Cobbler	195	84	65	187	75	68	Med.early
Snowflake	191	83	64	224	84	65	Med.early
Morgold Russet	183	85	61	184	77	66	Early
Pennchip	127	75	68	188	76	71	Med.late
LSD (.05)	30	4	.005	41	7	.003	
CV (Pct.)	9.6	3.3	3.6	12.9	5.6	1.8	

NORTH DAKOTA
R. H. Johansen

Potato Crossing Program

Three hundred and thirty-eight potato crosses were made in the greenhouse during 1966. The crossing program emphasized the combining of parents with good tuber type, red color, russet skin, high yield, good quality, disease resistance and processing quality. Seed berries were harvested from the parent plants in May and the true seed was extracted by the use of a waring blender during June.

Greenhouse and Field Seedlings

Thirty-one thousand seedlings were grown in the greenhouse during the summer of 1966. Seedlings were transplanted into either clay or peat pots during July and August and harvested during November.

At the Langdon Experiment Station, twenty-one thousand nine hundred seedlings representing two hundred thirty-four families were planted by the use of an assisted feed potato planter on May 24 and 25 and harvested on the 26, 27, and 28, of September. 2,4-D drift from an adjoining field in June and a severe hail storm the latter part of July, caused considerable damage to the seedling field during 1966.

Advanced Selections

Under isolation at the Langdon Experiment Station, nine hundred and seventy-one advanced selections were grown for increase. Of these selections six hundred and sixty were second year, one hundred and eighty were third year and one hundred and thirty-one were fourth year and older clonal selections. All selections were planted in five-hill plots with the most promising selections planted in larger increase plots. Sections were planted on May 26 and harvested on September 13, 14 and 15.

To control insects at Langdon, Thimet, a systemic insecticide was applied in a band form at planting time. In addition to Thimet, all plots were sprayed regularly with Thiordan during July and August. Approximately 400#/A of 16-16-8 fertilizer was applied at planting time. Plots were rogued each week for any visible viruses.

At Langdon, application for seed certification was made on twenty-one advanced selections. Seed certification involved three field inspections and general observations made by personnel from the North Dakota State Seed Department.

Duplicate plantings of most all advanced selections were planted in scab and adaptation plots at Grand Forks, Park River, Englevale and Fargo. The Grand Forks plot which included all advanced selections was planted on May 20 and harvested September 7 and 9. At Englevale and Park River, third-year and older selections were planted on May 10 and 13, respectively. Harvesting of plots was completed on September 12, at Park River, and on September 30, at Englevale.

Progeny testing of advanced clones was again conducted at Grand Forks, North Dakota and at Baton Rouge, Louisiana. This year was the third year that a large planting of each clone was made at both locations. During 1964, ninety-five clones were tested and in 1965, the number of promising clones had been reduced to thirty-six. In 1966, a total of sixteen clones were tested with the probability that by next season only three or four will warrant further increase and testing.

Promising Selections

Promising advanced selections were again distributed to several foundation growers in eastern and western (Beach area) North Dakota. Seventy-one selections were distributed to growers in the Beach area and seven selections were distributed to growers located in eastern North Dakota. At Beach, twenty-seven third-year selections and thirty-three second-year selections were distributed for initial seed increase.

Two selections ND 5899-1 and ND 5778-2R released to North Dakota growers three years ago now has a substantial seed increase. Growers in eastern North Dakota, have the largest increase of the red selection of ND 5778-2R while the growers in western North Dakota, have the largest increase of white selection ND 5899-1. However, by 1967, seed of both selections should be evenly distributed in fairly large quantities over the State. ND 5778-2R is a red selection with good type, good red color, high yield and specific gravity while ND 5899-1 has excellent chipping quality, high yield and high specific gravity. Both of these selections appear to have variety potential and will possibly be named within the next year or so.

Advanced selections showing varietal promise are found in North Dakota table 1. Nineteen of the selections outstanding in 1965 were rated fairly high in overall performance during 1966. ND 5778-2R, ND 5899-1, ND 6127-10R, ND 5886-2, ND 5507-19, ND 4524-4R, ND 6306-4R and ND 5782-1R, have shown the most promise for three or more years.

Processing Trials

In cooperation with Campbell Soup Company, Camden, New Jersey, and the USDA Processing Laboratory, East Grand Forks, Minnesota, several numbered advanced selections were tested for processing qualities. Samples of the potatoes to be processed were grown in non-replicated trials at Grand Forks, during 1965 and 1966.

In 1965-66, twenty selections and one named variety were tested for french fry quality by the Campbell Soup Company. Tuber samples were rated for color, texture and shrinkage. LaChipper was included in the test and used as a standard variety. ND 5899-1 and ND 6127-10R were rated the highest in the overall french fry quality tests, however, ten North Dakota selections exceeded the standard variety LaChipper in color and texture.

In October 1966, samples of several advanced selections were shipped to the Campbell Soup Company, research laboratory at Camden, New Jersey, and will be tested this winter for frozen french fries and other processed potato foods. Processing tests are to be classified as either screening, kitchen or factory, depending on the quantity of fresh product available.

Cooperative tests were also conducted in cooperation with Campbell Soup Company, Ltd., at Portage La Prairie, Manitoba.

In 1965-66, thirty-seven advanced selections and seventy-second year selections were tested for chipping quality by the Potato Processing Laboratory, East Grand Forks, Minnesota. LaChipper was used as the standard chipping variety. The samples were chipped prior to being placed in cold storage on October 14, immediately out of cold storage on March 2 and after 4 weeks of reconditioning. Flake quality was also determined on several selections. Chip color and percent reducing sugars are reported in North Dakota table 2.

During 1966-67, ninety-one second year selections and nineteen advanced selections will be tested for chip color by the Potato Processing Laboratory. The second year selections consisting of only three or four tubers will be tested for chip color after reconditioning while the more advanced selections which are of a larger quantity will be given more extensive chipping tests. In addition to the advanced North Dakota selection that will be tested, eleven USDA selections and twelve Frito-Lay selections grown in similar trials will be tested for chip quality by the Potato Processing Laboratory at East Grand Forks.

Since the USDA Processing Laboratory was initiated at East Grand Forks, the majority of the chip quality work has been conducted at this laboratory. However, certain chip quality studies involving variety trials, etc., has remained at NDSU. In 1966, samples of eleven varieties and selections grown at Grand Forks, Park River, Carrington-dry land and Carrington-irrigation were tested for chip quality (North Dakota tables 3 and 4). Samples from 2 replications were chipped out of cold storage and after reconditioning for 6 weeks at 70° F., ND 5899-1 and ND 6127-10R were equal or better than Kennebec in chip quality.

Variety Trials

Replicated variety trials were again grown at Park River, Grand Forks, Minot, Williston, and Carrington. Trials were grown under dry land conditions at all locations except Carrington. Due to the unavailability of irrigation facilities now at Williston, the irrigation trial was discontinued in 1966 and in the future only a dry land trial will be conducted at this station. Trials at Minot and Williston, were conducted by G. N. Geiszler and E. French. The Carrington trial was conducted by H. Olson and C. Hemstad. At Park River, R. Knutson and O. Fjestad, were in charge while at Grand Forks, E. Pearson, was in charge of general care and maintenance of the trial. Due to disease, the trial at Carrington was abandoned late in the season and not harvested.

The varieties were grown in plots of twenty-five hills and replicated four times in a randomized block. Twenty varieties and selections were grown in trial at Minot and Williston. Twenty-five varieties and selections were grown in trials at Carrington, Park River and Grand Forks. At Grand Forks, fourteen additional advanced North Dakota selections were grown in replicated trials along with the state-wide and regional trial. Tubers from all plots were harvested and weighed to obtain marketable and total yield. Marketable yield consists of all tubers of number one quality over 1 7/8 inches in diameter. Specific gravity was determined by the use of a potato hydrometer.

Spacing, fertilizer, soil type, planting and harvest dates of each location were as follows:

Location	Spacing		Fertilizer	Soil Type	Planting	Harvest
	Row	Plots			Date	Date
Grand Forks	38"	12"	400#/A 16-16-8	Bearden Clay Loam	5/19	9/15
Park River	36"	12"	400#/A 16-16-8	Glyndon Silt Loam	5/13	9/12
Williston	38"	14"	70#/A 11-48-0	Williams Silt Loam	5/20	9/23
			Side Dressed			
			6/28 with N-55#/A			
Minot	42"	14"	None	Williams Loam	5/19	9/29

The 1966 season was warm during July and quite cool during August. May, June, and September were normal. Grand Forks, had 6.04" of rainfall during July and 2.46" during August. Minot received approximately 2" of rainfall per month during the growing season.

The high temperatures during July caused most varieties to set tubers quite late in the season and the cool temperatures during August was ideal for rapid tuber development. The growing condition during 1966, caused many selections and varieties to develop serious external and internal defects. Hollow heart and growth cracking were quite common during the 1966 season.

In comparison to previous years, the yields in 1966 were slightly lower at all locations except Park River. The average yield of 25 varieties and selections grown at Park River was 234 cwt. per acre. At Grand Forks, the average yield of similar varieties and selections was 165 cwt. per acre, however, certain selections and varieties showed a wide difference in yield response when grown at the two locations. No doubt, the high incidence of late blight at Grand Forks drastically reduced the yield of many selections and varieties.

ND 5886-2, Cobbler and Red Pontiac produced the highest average yield when tested at four locations (North Dakota table 5). Other varieties and selections producing high yields were ND 5899-1, Kennebec and ND 4524-4R. At Grand Forks and Park River, the variety Chieftain, recently released by Iowa State University, produced yields comparable to Red Pontiac. The type and color of this new variety was good. ND 5778-2R, produced yields comparable to LaRouge and Viking and looked outstanding at all locations.

Selections and varieties grown in trial at Williston and Park River, produced the highest percent total solids (North Dakota table 6). The Grand Forks trial produced the lowest percent total solids. Again the high incidence of late blight at Grand Forks, was a factor in producing a fairly low percent total solids at this location. Most all varieties and selections in the Grand Forks trial were completely defoliated by late blight on September 1.

For the second year, ND 5899-1 produced the highest percent total solids. The average of this selection grown at all locations was 22.4 percent total solids. At Williston, ND 5899-1, produced 25.0 percent total solids. The two red selections ND 5778-2R and ND 6127-10R, produced total solids comparable to Cobbler. Chieftan, was comparable to Red Pontiac and Norland in percent total solids.

Only for varieties and selections grown in trial at Park River was russet or common scab a problem. ND 5778-2R, seemed to be quite resistant to scab, while ND 5899-1 appeared to be similar to Kennebec in susceptibility to scab. Late blight was a serious disease problem in 1966. This disease was particularly severe in the counties located in the central part of the Red River Valley. However, at harvest, tubers infected with the late blight organism were found at all locations, including the trials in western North Dakota.

North Dakota table 1. Characteristics of promising North Dakota selections.

Selection Number	Parentage	Gen.Tuber Rating ^{1/}	Maturity ^{2/}	Other Characteristics
ND6291-1R	3430-4R x Neb. 38.49-6	3.5	3	
ND6362-7	4708-8 x 5036-2	3.5	2	
ND6425-2R	4989-2R x Neb. 38.49-6	3.7	3	Good color
ND6462-1	5118-1 x B3692-4	3.5	2	
ND6606-2R	4524-7R x 4652-4R	3.5	3	" "
ND6625-2R	4652-4R x Norland	3.7	2	
ND6719-24R	Bounty x 4524-7R	3.5	3	
ND6719-36R	" x "	4.0	3	
ND6748-2	Norgleam x B5132-9	3.7	2	
ND6828-4	B5089-18 x 3022-18	3.7	3	
ND6836-15R	B5091-3 x TL 1859	3.5	2	
ND6880-8	La 91-143 x Snowflake	3.5	2	
ND6911-5	W 56 x 5288-8 Russ	3.5	2	
ND6925-13 Russ	Norgold Russet x 5488-26	3.7	2	Russet
ND6933-13	4888-5 x 3022-18	3.5	3	
ND6948-6R	5219-1R x 4524-7R	3.5	2	
ND6948-14R	" x "	3.5	3	
ND6986-5 Russ	5480-11 Russ x 5502-15	3.5	3	Russet
ND6989-2 Russ	5488-2 Russ x 5502-26 Russ	3.5	2	Russet
ND6997-6 Russ	5502-26 Russ x 5281-5	3.7	2	Russet
NE7003-2 Russ	5570-7 Russ x 5488-3	4.0	2	Russet
ND7035-6R	5896-3R x 4524-7R	3.5	3	
ND7045-6	5901-3 x La 91-143	4.0	2	
ND5737-11	Antige x 4356-5	4.0	2	Chips
ND5774-10R	Bounty x 4691-1R	3.7	3	Good color
ND6046-2	4666-2 x M 5227-5	4.0	1	
ND6452-4R	5082-6R x 4524-16R	3.5	3	Scab resistant
ND6535-16 Russ	Snowflake x Norgold Russet	3.5	2	Russet
ND6594-16 Russ	Norgold Russet x Snowflake	3.5	3	Russet
ND6596-7 Russ	" " x 5209-1 Russ	3.5	3	Russet
ND6598-4 Russ	" x 5488-37 Russ	3.5	2	Russet
ND6609-1R	4524-7R x 5228-4R	3.7	2	
ND6678-1 Russ	5138-4 x Norgold Russet	3.5	2	Russet
ND6679-1	" x 4632-9	3.5	2	
ND6127-10R	Red LaSoda x 4972-1R	3.5	2	Chips, high solids
ND6286-1	Snowflake x B3692-4	3.0	2	
ND6306-4R	Viking x Neb. 38.49-6	3.5	5	Some frost resistant
ND6428-1	4993-3 x B3892-4	3.0	2	
ND6509-7R	5219-6R x 4524-7R	3.0	2	High yield
ND5778-2R	Redkote x 4468-1R	3.5	3	Good type and color
ND5782-1R	Red LaSoda x 4524-7R	3.2	3	
ND5886-2	LaChipper x Snowflake	3.2	2	Fair chipper, high yield
ND5899-1	M5009-2 x 4631-3	3.2	2	Excellent chipper
ND5922-12	W56 x Snowflake	3.5	3	Chips, some late blight resistance
ND5944-14R	3962-8R x 4524-7R	4.0	3	Good color
ND5507-19Russ	3919-2 x 457-1	3.0	2	Russet
ND4524-4R	TL 1859 x 3842-3	3.2	4	High yield

^{1/}General tuber rating 1=poor type, 5=excellent type (Average 2 locations--Park River and Grand Forks) ^{2/}Maturity readings taken at Park River (1 early-5 late)

North Dakota table 2. Chip quality tests conducted on promising advanced selections^{1/}

Selection Number	Reducing Sugars			Chip Color ^{2/}		
	Date ^{3/}			Date ^{3/}		
	10/14 Pct.	4/2 Pct.	4/30 Pct.	10/14	4/2	4/30
ND4957-4	1.00	1.63	.46	10	11	7
ND5363-9	1.47	1.58	.67	11	11	10
ND5402-7	.44	1.18	.31	9	10	8
ND5438-5	1.09	1.32	1.10	11	11	10
ND5470-13	.80	1.27	.33	10	10	8
ND5488-11	.59	.95	.29	9	9.5	7
ND5507-19	.35	1.78	1.12	10	11	10
ND5737-3	.78	1.14	.59	8	9.5	7
ND5737-11	.21	.30	.32	7	8	4
ND5741-2	.67	1.88	.65	9	11	8
ND5751-7	.40	.81	.17	8	9.5	6
ND5761-5	.34	1.02	.24	7	9.5	5
ND5768-6	.53	1.50	.54	9	11	8
ND5768-10	.46	.91	.32	7	9.5	9
ND5886-2	.74	1.31	.59	10	11	9
ND5899-1	.42	.76	.25	8	9.5	7
ND5903-12	1.06	.98	.23	9	10	7
ND5922-12	1.00	1.54	.32	10	11	7
ND5979-2	.13	.32	.21	6	7	6
ND6017-5	.38	1.48	.29	10	11	8
ND6051-2	.54	1.17	.28	7	10	7
ND6084-6	.79	1.11	.59	8	10	10
ND6127-10R	.31	.93	.23	6	11	5
ND6166-3	1.28	1.39	.86	10	11	9
ND6204-1	.60	1.07	.64	8	9	9
ND6209-2	.48	1.10	.20	9	11	7
ND6286-1	.88	1.22	.33	9	11	8
ND6299-4	.60	1.08	.17	8	11	7
ND6327-3	.92	.60	1.07	11	11	10
ND6327-7	.56	.96	.63	9	10	9
ND6345-3	.63	1.38	.29	8	10	8
ND6350-2	.40	.82	.25	6	9.5	6
ND6386-1	.79	1.58	.56	9	11	9
ND6428-1	1.42	1.18	.63	11	11	9
ND6535-8	.50	1.37	.31	8	10	9
ND6694-6	.65	1.07	.32	10	11	8
LaChipper	1.07	1.52	.47	9	9.5	9
La 11-40	.39	1.50	.22	8	9.5	6

^{1/} Quality tests determined by USDA Processing Laboratory, East Grand Forks, Minnesota.

^{2/} Chip color determined by standard chip color test. (1 light 11 dark).

^{3/} 10/14-before storage at 40° F., 4/2-out of storage at 40° F., 4/30-after reconditioning at 70° F.

North Dakota table 3. Chipping tests of varieties and selections grown at Carrington under dryland and irrigation, 1965-66.

Variety and Selection Number	Carrington Dryland				Carrington Irrigation			
	Chipped Feb. 15 1/		Chipped March 21 2/		Chipped Feb. 15 1/		Chipped March 21 2/	
	Chart	Photo	Chart	Photo	Chart	Photo	Chart	Photo
	3/	4/	3/	4/	3/	4/	3/	4/
	Yield	Pct.	Yield	Pct.	Yield	Pct.	Yield	Pct.
Cobbler	9.5	11.3	30.0	33.0	9.5	11.8	29.1	29.5
Kennebec	11.0	9.3	32.3	30.7	6.5	6.9	28.1	32.1
LaChippier	10.5	6.0	26.4	29.7	8.0	8.0	28.3	27.7
Shoshoni	11.0	6.9	30.2	31.1	10.3	4.8	26.4	27.7
Snowflake	11.0	5.3	30.5	29.6	11.0	4.8	26.0	27.7
ND4524-4R	10.0	4.8	27.1	29.4	11.0	6.3	26.4	29.5
ND5507-19	11.0	5.5	28.1	30.3	11.0	4.5	27.6	29.1
ND5778-2R	10.0	6.7	30.5	33.5	10.0	5.5	28.2	31.2
ND5782-1R	11.0	6.5	27.6	28.4	11.0	4.0	26.3	28.1
ND5899-1	10.0	11.3	31.2	32.6	9.0	7.0	28.0	31.9
ND6127-10R	9.5	12.0	29.7	27.8	9.0	8.5	28.6	30.5
Average	10.4	7.8	29.4	30.6	10.2	6.5	27.5	29.5

1/ Chipped out of 40° storage.

2/ Chipped after reconditioning for 5 weeks at 70°.

3/ Color determined by standard color chart (1 light 11 dark) and photovolt reflectance meter--(high numbers indicate light colored chips).

4/ Percent chip yield.

North Dakota table 4. Chipping tests of varieties and selections grown at Grand Forks and Park River, 1965-66.

Variety and Selection Number	Grand Forks				Park River			
	Chipped Feb. 15 ^{1/}		Chipped March 21 ^{2/}		Chipped Feb. 15 ^{1/}		Chipped March 21 ^{2/}	
	Color ^{3/}	Photo	Color ^{3/}	Photo	Color ^{3/}	Photo	Color ^{3/}	Photo
	Chart	volt	Yield ^{4/}	Pct.	Chart	volt	Yield	Pct.
Cobbler	10.0	8.5	29.8	33.4	11.0	6.5	30.5	32.2
Kennebec	9.3	13.2	32.1	33.8	9.0	13.3	31.2	34.8
LaChipper	8.5	14.0	29.7	31.3	9.5	9.8	32.8	32.3
Shoshoni	10.0	7.3	28.7	31.3	11.0	5.3	27.3	32.9
Snowflake	10.5	7.3	30.0	33.5	11.0	5.5	30.3	34.8
ND 4524-4R	7.7	11.8	30.5	30.3	10.5	7.5	28.8	31.0
ND 5507-19	11.0	7.3	31.2	30.0	11.0	4.9	29.0	31.2
ND 5778-2R	10.0	8.9	29.6	31.9	9.0	9.0	31.1	30.0
ND 5782-1R	10.5	6.5	26.8	29.5	10.0	6.5	27.4	31.1
ND 5899-1	6.3	18.5	31.6	34.3	10.0	8.0	30.6	34.3
ND 6127-10R	9.5	11.3	29.7	31.2	9.0	11.0	26.7	32.3
Average	9.4	10.4	30.0	31.9	10.1	7.9	29.6	32.4

1/ Chipped out of 40° storage.

2/ Chipped after reconditioning for 5 weeks at 70°.

3/ Color determined by standard color chart (1 light 11 dark) and photovolt reflectance meter--(high numbers indicate lighter colored chips).

4/ Percent chip yield.

North Dakota table 5. Marketable yield of varieties and selections grown in State-wide trial, 1966.

Variety	Yield Per Acre				
	Minot	Williston	Grand Forks	Park River	Average
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
ND5886-2	152	165	178	304	200
Cobbler	182	134	212	257	196
Red Pontiac	158	140	222	258	194
ND5899-1	180	120	175	272	187
Kennebec	171	141	184	234	183
ND4524-4R	115	131	189	291	182
Norland	153	145	142	264	176
Viking	120	116	185	275	174
ND6127-10R	129	129	171	259	172
Norgold Russet	152	132	123	284	172
LaRouge	161	147	132	246	171
ND5778-2R	133	114	163	266	169
ND6509-7R	139	145	170	223	169
ND5922-12	163	119	191	203	169
ND5782-1R	116	119	195	234	166
ND5768-10	121	132	171	177	150
ND5507-19	122	114	144	215	149
ND6286-1	101	79	206	153	134
ND4957-4	89	132	118	173	128
Russet Burbank	135	61	54	155	101
Chieftan			227	257	242
Snowflake			184	255	220
LaChipper			159	221	190
Monona			143	202	173
ND5281-22			82	182	132
Average	140	126	165	234	167
LSD 1%	39	42	34	36	
5%	28	30	25	27	

North Dakota table 6. Percent total solids of varieties and selections grown in State-wide trials, 1966.

Variety	Total Solids				
	Minot	Williston	Grand Forks	Park River	Average
	Pct.	Pct.	Pct.	Pct.	Pct.
ND5899-1	21.8	25.0	20.3	22.4	22.4
ND5768-10	21.6	24.6	19.9	22.7	22.0
Cobbler	22.7	23.5	20.1	22.0	22.0
ND5778-2R	22.0	24.4	19.0	21.8	21.8
ND6127-10R	20.7	23.5	19.9	22.0	21.6
ND5922-12	21.4	24.2	19.4	21.4	21.6
Kennebec	21.8	24.4	19.4	20.9	21.6
Russet Burbank	21.6	23.3	19.4	21.6	21.6

continued

North Dakota table 6, continued.

ND6509-7R	19.9	22.7	20.1	22.2	21.2
Norgold Russet	20.7	22.4	19.0	21.4	20.9
LaRouge	21.2	23.7	18.4	20.3	20.9
ND4524-4R	19.4	22.7	19.2	21.6	20.7
ND4957-4	19.4	23.7	18.6	20.9	20.7
ND6286-1	21.2	22.4	18.6	20.5	20.7
Viking	20.3	22.7	18.8	20.7	20.5
ND5886-2	20.9	22.0	17.5	19.9	20.1
Norland	19.0	20.7	18.6	20.3	19.7
Red Pontiac	18.8	21.8	18.0	20.3	19.7
ND5507-19	19.0	19.2	18.4	20.5	19.2
ND5782-1R	18.2	20.1	16.9	19.4	18.6
LaChipper			19.4	21.2	20.3
Snowflake			18.0	21.2	19.7
ND5281-22			17.7	21.6	19.7
Monona			18.2	20.1	19.2
Chieftan			18.2	20.1	19.2
Average	20.6	22.9	18.8	21.1	20.9

OHIO
Floyd Lower

Variety Trials

The work was done on a cooperative arrangement between the Department of Horticulture of the Ohio Agricultural Research and Development Center and the Ohio State University in cooperation with the Ohio Potato Growers' Association and local growers. Twelve varieties were replicated once on each of five farms, thus making ten trials of each variety. Each plot consisted of two rows, in each of which 50 seed pieces were planted. Seed spacing varied from eight to eleven inches in the row and from 30 to 36 inches between rows. Planting dates varied from April 16 to June 1.

The grower's fertilizer program, cultural practices, and spray programs were followed in each case. Fertilizer practices varied slightly, but were generally in the equivalent of about 1300 pounds of 8-16-16 with additional nitrogen plowed down on four of the five farms. Herbicides were used on four of the farms, and systemic insecticides were used on four of the five farms.

Late April and May were cold and wet. It was quite dry beginning in June and continuing most of the season, but most severe in June and July. Temperatures were extremely high from June 19 to July 19 with 90° or above on most days from June 22 to July 4. Soil temperatures under the plants reached 80° or above in the latter period. Because of the high temperatures and drouth, considerable variation in yield occurred from farm to farm.

The plots were irrigated on two of the five farms. The seed was cut shortly before planting in each case and was dusted with captan.

The percentage of potatoes graded as marketable was lower than in the three preceding years; the average of all lots for the five farms was 84.7%. LaChipper had the highest percentage of total yield graded as marketable; it has been among the top varieties each year. Ona, Katahdin, Sebago and Superior followed.

More than half of the Snowflake plants showed characteristics of Fusarium and/or Verticillium wilt. Norgold, Haig, Superior and Monona varied from 36 percent for the first to 20 percent for the last. LaChipper showed but 15 percent. However, stem end discoloration was most severe in Monona, Snowflake, Sebago, Arenac, and Penobscot in the order listed. Haig and Norgold were lowest.

Snowflake, Norgold, Monona, Haig, and Arenac were severely injured by the high temperatures and drouth. Snowflake matured ahead of Haig and Superior on all farms whereas it should have followed them in maturity. It apparently can not withstand extremely high temperatures.

Yield are presented in Ohio tables 1 and 2. Notice that for four years, Kennebec, Katahdin, LaChipper and Ona led in yield and that the yields of these varieties were practically the same. LaChipper has always averaged higher in yield than all other early varieties.

Snowflake, although its yields have been equal to or slightly better than Superior in prior years, can hardly be recommended for Ohio; Superior's overall performance has been better than Snowflake. Norgold Russet also can hardly be

recommended except possibly for growers wishing to grow an early scab resistant russet for table stock only. Like Snowflake, Norgold is susceptible to wilt, late blight, and drouth; and it will not make a satisfactory chip.

Haig did not yield as well as the other early varieties. Monona appears to be subject to wilt and leaf roll although it reconditions well for chipping after storage. The performance of Arenac seems to be erratic. It is not much earlier and is much less dependable than Katahdin.

Recommended standard varieties for Ohio are Superior, Katahdin, Kennebec, and Sebago. LaChipper can be recommended as a medium early variety for field trials by growers. The same is true for Ona as a late variety. Penobscot needs further testing.

Ohio table 1. Marketable yield average of 12 varieties grown on four farms, 1966.

Variety	Marketable Yield Per Acre		Average Weight of 40 Tubers
	Pct.	Cwt.	Lbs.
Kennebec	75	289	19.6
LaChipper	91	281	13.0
Katahdin	89	269	19.4
Superior	88	255	18.5
Ona	89	234	17.1
Monona	82	228	20.9
Sebago	88	225	16.8
Penobscot	85	221	16.7
Norgold Russet	77	220	16.1
Haig	87	203	14.3
Arenac	81	201	15.8
Snowflake	82	194	14.3
Average	84	235	16.9

Ohio table 2. Average yields of marketable potatoes, 1963-1966.

Variety	Marketable Yield Per Acre				Average
	1963 Cwt.	1964 Cwt.	1965 Cwt.	1966 Cwt.	
Fundy	198	240			
Haig				203	
Cobbler	213	244	250		236
Superior	213	261	289	255	254
Snowflake	245	276	284	194	250
Norgold Russet		263	259	220	247
LaChipper	252	316	325	281	294
Monona				228	
Avon	271	265			
Plymouth	250	265			
Chippewa		303	302		
Penobscot				221	
Arenac	261	257	332	201	263
WY 1122	309	210			
Teton	294	272			
Katahdin	297	217	404	269	297
Kennebec	273	252	394	289	302
Pennchip		217	379		
Sebago	242	267	374	225	277
Ona	278	246	401	234	290
Average:					
All Lots	256	252	320	235	266

PENNSYLVANIA

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Potato variety performance trials in 1966 were conducted at five locations as follows: 1. Chest Springs, Cambria County (central); 2. Centre Hall, Centre County (central); 3. Waterford, Erie County (northwest); 4. Manheim, Lancaster County (southeast); and 5. Germantown, Lehigh County (east central). Elevations at each of the five experimental sites were approximately 2000-, 1300-, 1240-, 440-, and 660-feet above sea level, respectively. Actual and normal precipitation from April 1 to October 10 at U.S. Weather Bureau reporting stations within 12 miles of the experimental sites are shown in tabular form below:

----- Precipitation -----					
Location	Nearest Rep't. Station	Apr. 1 to Sept. 12	Departure from Normal*	Sept. 13 to Oct. 10	Departure from Normal* Apr. 1 to Oct. 10
Cambria	Altoona	10.47	- 8.52	4.44	-6.58
Centre	State College	12.64	- 7.19	5.16	-7.37
Erie	Erie	16.29	- 1.95	3.25	-1.92
Lancaster	Lancaster	13.13	- 9.66	6.54	-6.07
Lehigh	Allentown	12.42	-10.37	5.95	-7.64

* 1931 to 1960 equals normal

Field experiments were conducted in cooperation with Pennsylvania potato growers, except in Centre County. The Centre County trial was conducted at the Department of Agronomy research farm. Cooperators performed recommended cultural and management practices.

Prior to planting, soil samples were collected and analyzed by the University Soil Testing Laboratory. Fertilizer applications were made at planting on the basis of soil test results aimed at 300 Cwt/A.

Before planting, rows 36-inches apart were marked-out and a systemic insecticide banded in the row. Varietal seed pieces (4-cut) were machine planted, with an experimental assist-feed planter, between 9- and 10-inches apart within the row while simultaneously banding the recommended fertilizer application within 25-foot single-row plots. Thirty seed pieces per plot were planted. Three-foot breaks were maintained between plots.

For the 42 varieties and seedlings included in this investigation, seed of 35 varieties was supplied by the U.S.D.A. Seedling numbers 6 CX-6 and 6 HS-9 were provided by the Department of Plant Pathology. Seed potatoes of Norland, Pungo, Katahdin, Kennebec and Sebago was grown in Maine and purchased from Agway, Inc.

A randomized block design with four replications for each of the three maturity groups, i.e., early, midseason, and late was employed.

Production indices included: percent stand; total yield in Cwt/A (tubers 1 ½-inches or greater in diameter); percent of total yield between 1 7/8- and 4-inches in diameter, and percent of total yield between 2 ½- and 4-inches in diameter (Size A). Chip indices were performed at the Food Processing Laboratory in the Department of Horticulture. After fall harvest and grading, composite tuber samples from four replications (approximately 30 pounds) were taken and stored in the Department's potato cellar. Specific gravity was determined with a potato hydrometer. Readings were converted to total solids (percent dry matter) by the table recently reported by G.V.C. Houghland. Chip indices, i.e., chip yield and color, were performed after storage at room conditions for approximately 4 weeks. Chip yield was determined on 8 oz. samples of peeled potatoes. Rd color values were determined with the Gardner Automatic Difference Color Meter against color standard #C-LY-1047-57. Values 20.0 and above are considered commercially acceptable. All chip indices were performed on duplicate samples.

Cultural information and determination dates for indices performed on potato varieties produced in 1966 are shown in tabular form as follows:

-----Dates-----						
Location County	Planting Date	Fertilizer at Planting-Lbs/A	Stand Counts	Harvest	Specific Gravity	Chipping
Cambria	5/24	100-200-100	7/22	10/21	12/1	12/19
Centre	5/26	96-288-96	7/1	10/18	11/22	1/9
Erie	5/18	100-200-100	7/14	10/12	11/17	12/20
Lancaster	5/3	120-120-120	6/28	10/25	11/22	12/20
Lehigh	4/26	80-80-80	6/14	10/24	11/23	1/9

Production- and chip-indices data were analyzed statistically with the analysis of variance technique by the IBM 7074 computer at the University Computation Center.

The results of the 1966 Pennsylvania Variety Trials are presented in Pennsylvania tables 1-7.

Pennsylvania table 1. Potato variety performance trial in Cambria County, Pennsylvania, 1966.

CAMBRIA COUNTY								
Production Indices					Chip Indices			
Variety or Stand		Yield Per Acre			Specific Gravity	1/ Solids	Yield Lb/100 Lb	Color Rd
		Total	1-7/8" to 4"	2-1/2" to 4"				
Seedling	Pct.	Cwt.	Pct.	Pct.		Pct.		
EARLY								
B5132-3	86	161	90	71	73	19.8	29.9	21.4
Cobbler	92	157	92	79	80	21.2	29.8	26.6
B5088-7	87	136	84	58	76	20.5	26.1	10.8
Nor. Russet	94	136	81	53	74	20.0	27.9	13.0
B4829-7	88	136	83	58	76	20.5	31.8	23.4
B5000-18	88	130	85	57	72	19.7	28.0	17.8

continued

Pennsylvania table 1, continued.

Norland	81	84	88	64	71	19.4	27.2	21.8
Superior	62	84	95	82	75	20.2	28.2	15.2
LSD .05	7	33	--	--	02	0.4	1.5	2.5
<u>MIDSEASON</u>								
Pungo	87	201	82	58	78	20.7	32.8	24.8
Chippewa	88	200	78	50	73	19.8	27.2	20.1
Emmet	89	185	72	44	76	20.3	29.6	22.8
B5090-11	77	182	87	66	74	19.9	27.6	16.6
Plymouth	91	180	82	55	74	20.1	30.8	25.6
LaRouge	92	177	87	52	80	21.2	29.3	19.2
B5066-3	91	167	75	45	76	20.5	25.4	14.0
WY1122	88	162	84	56	78	20.7	30.4	24.5
Alleghanna	94	150	84	58	75	20.2	27.0	15.5
Hunter	89	136	45	18	88	22.5	31.2	14.2
Monona	88	134	87	65	78	20.7	29.6	29.4
Catocsa	94	129	87	60	83	21.6	31.8	23.5
B5299-39	89	108	67	37	78	20.8	31.0	17.7
LSD .05	8	31	--	--	02	0.3	1.8	4.2
<u>LATE</u>								
Pontiac	91	264	95	87	66	18.5	27.2	11.3
Redskin	94	223	94	85	69	19.0	28.8	16.2
Russet Rural	92	220	93	83	80	21.1	33.1	26.2
Smooth Rural	92	209	96	88	79	21.0	30.9	18.9
Kennebec	88	205	93	85	75	20.2	28.8	24.1
Mohawk	86	199	97	94	80	21.2	26.9	11.8
Shoshoni	88	199	96	88	74	20.0	30.8	10.2
Rus. Burbank	96	197	85	64	84	21.8	30.8	19.0
Ona	94	194	90	75	80	21.2	30.6	17.4
Merrimack	96	190	91	76	84	21.8	--	--
Saco	94	189	88	75	77	20.6	30.3	16.9
Pennchip	92	178	93	85	74	20.1	27.8	24.6
B5052-7	86	176	93	83	74	19.9	26.2	11.1
Katahdin	76	174	92	84	81	21.3	30.6	19.6
6 CX-6	95	173	92	77	76	20.5	27.6	21.6
B5036-40	91	170	92	80	75	20.2	28.6	25.9
Delus	90	159	97	92	81	21.4	28.0	16.5
Penobscot	94	152	86	65	84	21.8	32.2	22.4
6 HS-9	84	137	92	82	76	20.4	30.4	24.4
Sebago	58	130	93	82	78	20.7	29.8	18.5
B5141-6	74	126	87	70	90	23.0	31.1	26.8
LSD .05	8	38	--	--	02	0.3	1.6	2.7

1/ 1.0 omitted from specific gravity values.

Pennsylvania table 2. Potato variety performance and trial in Centre County, Pennsylvania, 1966.

Variety or Seedling	Stand	Production Indices			Specific Gravity	Chip Indices			Color Rd
		Total	Yield Per Acre			Solids	Yield		
			1-7/8" to 4"	2-1/4" to 4"				Lb/100 Lb	
Pct.	Pct.	Cwt.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	
EARLY									
Superior	92	96	90	64	80	21.2	32.8	23.8	
B4829-7	92	88	77	50	76	20.4	30.5	22.2	
B5000-18	92	85	68	37	81	21.4	32.6	20.2	
B5132-3	87	85	59	28	84	21.8	31.6	23.6	
Cobbler	99	80	71	39	86	22.1	33.4	26.6	
Nor. Russet	91	78	63	33	83	21.6	31.6	17.6	
B5088-7	92	62	45	15	78	20.8	29.2	15.5	
Norland	88	61	61	26	78	20.9	32.7	24.6	
LSD .05	NS	NS	--	--	02	0.5	1.7	3.7	
MIDSEASON									
Pungo	94	174	82	58	77	20.6	34.8	20.7	
B5090-11	96	156	87	66	74	19.9	30.0	19.2	
Plymouth	93	121	82	55	70	19.2	32.0	25.8	
Monona	94	116	87	65	73	19.8	31.5	28.7	
Chippewa	97	113	78	50	78	20.8	32.3	27.7	
B5066-3	96	112	75	45	70	19.1	28.2	15.8	
Emmet	97	112	72	44	77	20.6	35.5	21.8	
LaRouge	98	109	87	52	72	19.6	33.5	20.8	
Alleghana	94	95	84	58	65	18.3	30.4	16.0	
Catoosa	92	93	87	60	82	21.4	33.0	20.6	
B5299-39	92	89	67	37	74	19.9	31.6	16.1	
WY 11-22	94	85	84	56	64	18.2	30.3	18.2	
Hunter	96	60	45	18	81	21.4	33.8	17.4	
LSD .05	NS	34	--	--	03	0.6	1.8	2.4	
LATE									
Shoshoni	92	244	91	80	72	19.6	32.2	10.7	
Merrimack	95	205	88	67	92	23.2	34.4	24.8	
Saco	96	204	85	67	80	21.1	31.3	18.2	
Redskin	98	196	94	81	70	19.2	33.9	16.0	
Pontiac	98	194	92	77	62	17.6	31.1	11.0	
Russet Rural	94	187	84	64	86	22.1	34.3	26.4	
Smooth Rural	92	187	83	63	79	21.0	33.8	25.3	
Kennebec	86	178	92	79	76	20.4	31.2	25.0	
6 CX-6	92	164	84	63	80	21.2	32.3	26.7	
B5141-6	96	164	89	75	92	23.2	33.8	20.6	
Ona	92	161	84	63	82	21.5	33.2	15.8	
B5052-7	89	157	90	74	70	19.2	28.2	12.2	
B5036-40	92	153	87	65	78	20.7	32.8	23.2	
Mohawk	92	148	94	87	86	22.2	34.6	19.6	

continued

Pennsylvania table 2, continued.

Katahdin	74	146	93	82	79	21.0	33.2	16.6
Rus. Burbank	97	144	62	30	86	22.2	34.5	25.0
Sebago	80	140	83	64	82	21.5	33.1	18.2
Pennchip	94	134	83	60	70	19.2	30.8	25.8
Penobscot	95	132	79	58	92	23.3	36.7	24.2
6 HS-9	86	114	90	81	73	19.8	30.0	24.6
Delus	87	113	93	86	80	21.2	36.0	23.6
LSD .05	7	64	--	--	.004	0.7	2.3	2.2

1/ See footnote 1, table 1.

Pennsylvania table 3. Potato variety performance trial, Erie County, Pennsylvania, 1966.

Variety or Seedling	Production Indices				1/ Specific Gravity	Chip Indices		
	Stand	Total	1-7/8" to 4"	2-1/4" to 4"		Yield Solids	Yield Lb/100 Lb	Color Rd
	Pct.	Cwt.	Pct.	Pct.		Pct.		
<u>EARLY</u>								
B5132-3	88	366	95	85	62	17.8	27.0	11.0
B4829-7	86	298	96	91	63	18.0	28.0	17.4
B5088-7	92	289	88	74	62	17.7	27.4	17.2
Cobbler	90	280	87	76	72	19.5	29.1	15.0
Nor. Russet	90	272	91	70	70	19.3	30.0	15.0
B5000-18	92	270	89	60	66	18.6	28.6	21.0
Norland	79	201	94	86	64	18.0	28.1	17.7
Superior	73	190	98	89	68	18.9	30.8	25.2
LSD .05	9	49	--	--	01	0.2	2.0	4.2
<u>MIDSEASON</u>								
LaRouge	100	378	93	83	68	18.8	27.4	12.8
B5090-11	90	360	90	74	65	18.3	26.9	18.3
Emmet	92	342	93	80	78	20.9	31.3	13.2
Plymouth	96	338	93	82	67	18.7	29.1	19.0
Pungo	93	337	94	78	78	20.9	31.0	14.7
WY 1122	90	334	94	85	66	18.6	26.4	11.8
B5066-3	84	324	97	84	58	17.1	26.4	14.0
Catoosa	88	322	93	97	70	19.3	31.1	19.0
Chippewa	88	319	94	86	70	19.1	29.1	16.2
Monona	86	310	96	88	64	18.2	28.4	25.4
Alleghanna	94	299	96	93	64	18.1	26.6	9.6
Hunter	95	294	92	80	78	20.9	29.8	14.6
B5299-39	86	282	95	80	64	18.2	28.4	16.4
LSD .05	NS	44	--	--	02	0.4	2.0	3.6

continued

Pennsylvania table 3, continued.

<u>LATE</u>								
Saco	92	428	94	83	70	19.1	29.2	13.6
Redskin	92	426	94	88	70	19.1	29.0	13.4
Pontiac	88	393	96	89	58	17.1	29.2	10.2
Kennebec	98	379	92	79	72	19.5	31.1	22.4
Penobscot	92	374	93	86	87	22.4	33.3	17.8
Shoshoni	97	371	96	90	64	18.2	27.1	7.8
6 CX-6	83	366	95	83	74	19.9	29.3	26.0
Russet Rural	88	364	89	71	77	20.6	31.0	17.4
Smooth Rural	96	350	93	78	76	20.5	30.8	16.6
Mohawk	82	350	95	89	80	21.2	30.8	16.6
6 HS-9	86	337	97	94	70	19.2	28.2	25.4
Russet Burbank	94	330	79	49	74	20.0	30.2	12.4
B5036-40	90	328	97	83	72	19.7	28.2	23.1
Delus	91	320	97	96	81	21.3	30.1	18.2
B5141-6	86	314	92	76	86	22.3	32.2	26.6
Pennchip	94	312	87	74	71	19.4	30.1	27.0
Merrimack	95	298	93	82	76	20.5	30.0	22.2
Kotahdin	83	297	95	88	72	19.7	29.8	17.2
Oma	92	290	90	77	70	19.3	29.2	18.2
B5052-7	88	286	95	84	62	17.7	25.8	15.6
Sebago	87	271	93	81	64	18.2	27.7	19.9
LSD .05	NS	59	--	--	02	0.5	2.2	3.0

1/ See footnote 1, table 1.

Pennsylvania table 4. Potato variety performance trial in Lancaster County, Pennsylvania, 1966.

Variety or Seedling	<u>Production Indices</u>				1/ Specific Gravity	<u>Chip Indices</u>		
			1-7/8"	2-1/2"		Yield		Color
	Stand	Total	to 4"	to 4"		Solids	Lb/100 Lb	Rd
	Pct.	Cwt.	Pct.	Pct.		Pct.		
<u>EARLY</u>								
B5132-3	86	274	86	69	62	17.7	27.8	19.2
Nor. Russet	92	232	64	34	66	18.5	27.2	19.0
B4829-7	86	230	89	78	70	19.3	29.3	21.4
B5000-18	88	215	79	53	72	19.6	27.3	18.4
B5088-7	89	212	75	47	73	19.8	27.0	22.8
Cobbler	93	208	75	48	74	19.9	28.0	22.2
Norland	91	191	81	53	66	18.5	27.6	25.2
Superior	71	155	81	59	72	19.7	27.8	21.4
LSD .05	9	48	--	--	02	0.4	NS	3.1
<u>MIDSEASON</u>								
Alleghanna	99	342	93	81	64	18.1	26.7	16.3
B509C-11	89	301	83	64	64	18.1	26.7	26.6
LaRouge	94	290	83	68	64	18.0	28.1	19.2
WY 1122	88	277	88	73	70	19.3	28.4	22.0
B5066-3	93	268	81	51	70	19.3	27.2	25.2
Monona	94	265	94	73	68	18.9	28.8	27.1

continued

Pennsylvania table 4, continued.

Hunter	95	256	78	51	80	21.0	30.8	22.3
Catoosa	89	256	86	67	72	19.5	30.4	27.1
Emmet	94	256	87	69	78	20.9	31.6	22.8
B5299-39	84	252	83	57	59	17.2	26.6	14.6
Pungo	91	240	81	65	81	21.4	30.4	20.3
Plymouth	94	222	89	80	70	19.2	28.9	25.8
Chippewa	98	222	77	57	72	19.6	26.9	28.6
LSD .05	NS	44	--	--	03	0.6	1.7	4.8

LATE

Pontiac	96	360	88	78	60	17.5	25.2	13.4
B5141-6	94	354	88	70	90	23.0	32.6	19.5
Katahdin	93	319	93	81	71	19.4	28.6	21.2
Saco	92	302	84	67	78	20.7	29.1	25.0
Redskin	88	298	90	74	73	19.8	27.9	22.6
Shoshoni	72	282	93	83	62	17.8	27.6	16.0
Kennebec	78	277	80	60	74	19.9	28.0	29.2
B5052-7	97	274	87	68	70	19.3	26.9	21.8
Ona	95	267	74	42	74	20.1	29.4	21.9
6 CX-6	95	260	87	71	80	21.2	28.7	22.4
Smooth Rural	96	244	85	65	72	19.6	29.8	27.6
Mohawk	91	243	91	78	79	21.0	28.4	25.2
Merrimack	94	241	85	62	88	22.6	30.6	27.8
Rus. Burbank	97	234	76	53	76	20.5	30.4	18.8
B5036-40	91	232	86	67	78	20.7	29.5	29.2
Russet Rural	94	216	84	66	70	19.3	31.0	23.8
Sebago	86	214	87	71	70	19.2	29.1	25.4
Delus	86	212	92	84	83	21.6	29.6	28.2
Pennchip	86	211	76	52	67	18.7	29.8	30.2
Penobscot	89	201	78	56	84	21.8	30.6	25.9
6 HS-9	93	200	77	59	74	19.9	29.1	27.4
LSD .05	12	53	--	--	03	0.5	1.4	3.0

1/ See footnote 1, table 1.

Pennsylvania table 5. Potato variety performance trial in Lehigh County, Pennsylvania, 1966.

Variety or Seedling	Production Indices				1/	Chip Indices		Color Rd
	Stand Pct.	Total Cwt.	1-7/8"	2-1/2"	Specific Gravity	Solids Pct.	Yield	
			to 4"	to 4"			Lb/100 Lb	
<u>EARLY</u>								
Cobbler	100	129	70	40	67	18.7	31.0	24.8
B5132-3	97	121	58	32	56	16.7	30.1	20.7
B4829-7	96	107	79	48	68	18.8	29.6	17.2
Norgold Russet	96	103	48	16	65	18.3	29.8	19.0
B5088-7	97	101	66	30	68	19.0	27.7	16.5
Superior	98	100	62	29	62	17.7	27.7	18.0
B5000-18	96	82	56	21	64	18.0	28.4	22.4
Norland	94	72	54	36	55	16.4	27.6	18.6
LSD .05	NS	NS	--	--	02	0.5	NS	NS

Pennsylvania table 5, continued.

<u>MIDSEASON</u>								
Plymouth	98	225	87	69	66	18.6	30.6	24.0
Alleghanna	96	206	82	60	57	16.8	27.8	18.6
LaRouge	98	195	72	52	64	18.0	26.8	15.0
WY1122	97	192	85	67	62	17.8	30.6	19.6
B5066-3	96	187	74	43	59	17.2	26.3	15.6
B5090-11	96	183	67	37	62	17.8	27.7	13.8
Emmet	90	178	83	60	72	19.6	30.5	18.4
Pungo	91	177	75	54	71	19.4	31.2	19.6
Chippewa	98	164	69	41	61	17.6	27.1	22.2
Momona	99	142	80	47	63	18.0	30.0	29.9
B5299-39	97	126	72	41	64	18.2	29.4	15.4
Catoosa	94	125	81	50	72	19.5	31.6	23.0
Hunter	99	109	50	20	73	19.8	30.3	16.4
LSD .05	NS	34	--	--	03	0.6	1.2	4.9
<u>LATE</u>								
Shoshoni	94	356	87	74	69	19.0	29.8	12.3
Smooth Rural	97	268	89	76	72	19.6	33.2	24.6
Redskin	100	266	84	59	68	18.8	28.4	19.3
Merrimack	98	263	86	69	75	20.2	31.8	22.7
Kennebec	90	261	83	65	63	18.0	28.6	22.6
Rus. Burbank	98	249	64	38	77	20.6	33.6	25.2
B5141-6	98	242	67	37	78	20.8	33.7	27.6
Pennchip	96	238	81	61	68	18.8	28.2	29.4
Russet Rural	97	237	84	70	77	20.6	33.0	23.8
Mohawk	90	236	90	77	66	18.5	29.1	13.2
Pontiac	100	235	82	68	58	17.1	26.4	8.4
Saco	96	228	75	52	72	19.7	31.1	25.0
Katahdin	82	213	89	70	66	18.4	30.0	20.8
Sebago	95	209	83	67	63	18.0	31.8	16.8
6 CX-6	96	207	78	57	68	19.0	29.2	22.9
Ona	92	200	81	61	73	19.8	30.4	19.8
6 HS-9	89	189	76	58	66	18.5	28.4	23.4
Delus	88	188	92	80	73	19.8	31.1	19.3
B5052-7	84	186	84	67	64	18.2	26.8	13.4
B5036-40	92	178	78	59	66	18.5	29.4	25.0
Penobscot	92	115	57	35	77	20.6	33.5	24.8
LSD .05	9	47	--	--	03	0.5	1.7	3.3

1/ See footnote 1, table 1.

Pennsylvania table 6. Potato variety performance trial, combined locations, 1966.

Variety or Seedling	Production Indices				1/ Specific Gravity	Chip Indices		
			1-7/8"	2-1/4"		Yield		Color Rd
	Stand	Total	to 4"	to 4"		Solids	Lb/100 Lb	
	Pct.	Cwt.	Pct.	Pct.		Pct.		
<u>EARLY</u>								
B5132-3	89	201	78	57	67	18.8	29.3	19.2
B4829-7	90	172	85	65	71	19.4	29.8	20.3
Cobbler	95	171	79	56	76	20.3	30.2	23.0

continued

Pennsylvania table 6, continued.

Norgold Russet	93	164	69	41	72	19.6	29.3	16.7
B5088-7	92	160	72	45	72	19.6	27.5	16.6
B5000-18	91	156	75	46	71	19.4	29.0	20.0
Superior	79	125	85	65	71	19.5	29.5	20.7
Norland	87	122	76	53	67	18.6	28.6	21.6
LSD .05	4	21	--	--	01	0.2	0.8	1.6

MIDSEASON

B5090-11	90	236	83	61	68	18.8	27.7	18.9
LaRouge	96	230	86	68	70	19.1	29.0	17.4
Pungo	91	226	83	64	77	20.6	32.0	20.0
Allehanna	95	218	90	76	65	18.3	27.7	15.2
Plymouth	94	217	89	74	70	19.2	30.3	24.0
Emmet	92	215	85	66	76	20.5	31.7	19.8
B5066-3	92	211	83	58	67	18.6	26.7	16.9
WY1122	91	210	89	73	68	18.9	29.2	19.2
Chippewa	94	203	82	63	71	19.4	28.5	22.9
Monona	92	193	90	70	69	19.1	29.6	28.1
Catoosa	91	185	88	67	76	20.3	31.6	22.6
B5299-39	90	171	80	55	68	18.9	29.4	16.0
Hunter	95	171	70	48	80	21.1	31.2	17.0
LSD .05	4	17	--	--	01	0.2	0.7	1.7

LATE

Shoshoni	86	290	93	83	68	18.9	29.5	11.4
Pontiac	94	289	91	80	61	17.6	27.8	10.9
Redskin	94	282	91	77	70	19.2	29.6	17.5
Saco	94	270	85	69	75	20.2	30.2	19.8
Kennebec	88	260	88	74	72	19.6	29.6	24.7
Smooth Rural	95	252	89	74	76	20.3	31.7	22.6
Russet Rural	93	245	87	71	78	20.7	32.5	23.5
B5141-6	90	240	85	66	87	22.5	32.7	24.2
Merrimack	96	240	89	71	83	21.6	31.8	23.5
Mohawk	88	235	93	85	78	20.8	30.0	17.3
6 CX-6	92	234	87	70	76	20.4	29.4	23.9
Russet Burbank	96	231	73	47	80	21.0	31.9	20.1
Katahdin	81	230	92	82	74	20.0	30.4	19.0
Ona	93	223	84	64	76	20.4	30.6	18.6
B5052-7	89	216	90	75	68	18.9	26.8	14.8
Pennchip	92	214	84	66	70	19.2	29.3	27.4
B5036-40	91	212	88	71	74	20.0	29.7	25.3
Delus	88	198	94	88	80	21.0	31.0	21.2
6 HS-9	86	195	86	75	72	19.6	29.2	25.0
Penobscot	92	195	79	60	85	22.0	33.3	23.0
Sebago	81	193	88	73	71	19.5	30.3	19.8
LSD .05	4	24	--	--	01	0.2	0.8	1.2

1/ See footnote 1, table 1.

Pennsylvania table 7. Potato variety performance trial, combined varieties, 1966.

COUNTY	Production Indices					Chip Indices		
	Stand	Total	1-7/8"	2-1/4"	Specific Gravity	Solids	Yield Lb/100 Lb	Color Rd
			to 4"	to 4"				
	Pct.	Cwt.	Pct.	Pct.		Pct.		
<u>EARLY</u>								
Erie	86	271	92	79	66	18.5	28.6	17.4
Lancaster	87	215	79	55	69	19.1	27.8	21.2
Cambria	85	128	87	65	75	20.2	28.6	18.8
Lehigh	97	102	62	32	63	18.0	29.0	19.6
Centre	92	79	67	36	81	21.3	31.8	21.8
LSD .05	3	16	--	--	01	0.1	0.7	1.3
<u>MIDSEASON</u>								
Erie	91	326	94	82	69	19.0	28.6	15.8
Lancaster	93	265	85	66	70	19.3	28.6	22.9
Lehigh	96	170	75	49	65	18.3	29.2	19.3
Cambria	89	162	91	76	78	20.7	29.5	20.6
Centre	95	110	78	51	74	19.9	32.0	20.7
LSD .05	2	10	--	--	01	0.1	0.4	1.0
<u>LATE</u>								
Erie	90	342	93	82	73	19.8	29.6	18.5
Lancaster	90	259	85	67	75	20.2	29.1	23.9
Lehigh	93	227	80	62	70	19.2	30.4	21.0
Cambria	88	184	92	81	78	20.8	29.7	19.2
Centre	91	165	87	70	79	21.0	32.9	20.7
LSD .05	2	12	--	--	01	0.1	0.4	0.6

1/ See footnote 1, table 1.

PENNSYLVANIA

E. C. Pifer

In 1966, Extension variety demonstrations were conducted in the following counties and regions: Potter county, northern region; Schuylkill county, east central region; Somerset county, southwestern region; and York county, southeastern region. Twelve varieties were evaluated for yield and chipping quality.

Specific gravity determination for all trials were performed by personnel in the Agronomy Department and the Department of Horticulture of the Agricultural Experiment Station.

Cultural Information and Rainfall

<u>County</u>	<u>Planting Date</u>	<u>Harvest Days</u>	<u>Length of Season-Days</u>	<u>Total Rainfall for Period Inches</u>
Potter	5/20	10/14	147	14.1
Schuylkill	5/5	10/13	161	15.4
Somerset	5/11	10/11	153	11.4
York	4/20	10/28	191	16.7

All demonstrations were designed as randomized blocks with four replications. Specific fertilizer applications at each location were made on the basis of soil test results. Recommendations were made to achieve a yield of 300 cwt. per acre. The fertilizer recommendations were: Potter county, 2000 lbs. 6-12-12 per acre; Schuylkill county, 1500 lbs. 10-20-10 per acre; Somerset county, 1200 lbs. 10-20-20 per acre; and York county, 800 lbs. 10-20-10 per acre. Seed pieces of each variety were hand-planted in 30-foot row plots, 9 inches apart within the row and with a distance of 34 inches between the rows.

Seed pieces of Norland were planted in the 5-foot breaks between plots to avoid varietal mixing at digging. Total yields were recorded at harvest and tubers were graded immediately. Composite varietal samples from the four replications combined were taken at each location and saved for specific gravity and chipping determinations.

Quality Determinations

Specific gravity was determined with the use of a potato hydrometer.

Experimental Results

Data for the four outlying county trials in Pennsylvania are shown in Pifer table 1.

Pifer table 1. Tuber yield and specific gravity determinations after harvest for 12 potato varieties produced in four counties in Pennsylvania, 1966.

Variety	U.S. No. 1		Specific ^{1/} Gravity
	Yield Per Acre		
	Cwt.	Pct.	
<u>Potter County</u>			
Russet Rural	251	87	84
6 HS-9	175	90	81
6 CX-6	160	84	79
B 5141-6	148	94	96
Pennchip	140	87	75
Kennebec	131	89	76
Katahdin	130	93	81
Sebago	130	86	77
Peconic	109	90	82
Irish Cobbler	77	79	83
Superior	77	92	82
Norland	<u>50</u>	<u>71</u>	<u>65</u>
MEAN	132	87	80
<u>Schuylkill County</u>			
Kennebec	299	76	59
Katahdin	236	72	65
Sebago	221	69	60
6 HS-9	214	60	65
B 5141-6	211	67	75
Peconic	175	79	70
Russet Rural	166	58	72
Pennchip	157	52	61
Norland	156	74	58
6 CX-6	146	47	66
Superior	116	57	60
Irish Cobbler	<u>104</u>	<u>52</u>	<u>67</u>
MEAN	184	64	64
<u>Somerset County</u>			
Kennebec	436	98	70
6 CX-6	379	97	71
B5141-6	353	97	87
6 HS-9	340	98	68
Russet Rural	326	97	71
Sebago	322	98	67
Katahdin	305	98	71
Peconic	298	98	77
Superior	284	98	76
Pennchip	239	91	64
Irish Cobbler	237	95	72
Norland	<u>132</u>	<u>92</u>	<u>60</u>
MEAN	304	96	71

Pifer table 1, continued

Variety	U.S. No. 1		Specific Gravity
	Yields Per Acre		
	Cwt.	Pct.	
<u>York County</u>			
6 CX-6	164	90	66
Irish Cobbler	149	91	73
Kennebec	139	88	66
B5141-6	136	90	77
6 HS-9	134	94	70
Peconic	113	90	76
Katahdin	104	92	60
Pennchip	95	78	65
Norland	94	82	55
Superior	92	93	68
Russet Rural	82	80	67
Sebago	<u>69</u>	<u>83</u>	<u>65</u>
MEAN	114	88	67
<u>Average</u>			
Kennebec	286	88	68
6 CX-6	268	80	70
6 HS-9	260	86	71
Russet Rural	255	81	73
B5141-6	247	87	84
Katahdin	223	89	69
Sebago	221	84	67
Pennchip	211	77	66
Peconic	193	89	76
Irish Cobbler	178	79	74
Superior	170	85	71
Norland	<u>135</u>	<u>80</u>	<u>59</u>
MEAN	221	84	71
LSD .05 locations 59			
varieties 71			

1/ 1.0 omitted from specific gravity readings.

PENNSYLVANIA

W. R. Mills

The breeding project continues to emphasize resistance to late blight and virus X, high yield, and good chipping and table quality. Screening for major genes for blight resistance is done in the seedling stage. Tests for resistance to virus X are made on the single-hill selections and the 10-hill selections, using severe strains of the virus which produce distinct symptoms in susceptible clones.

The 1966 season was the worst of several successive drought years, intensified by two consecutive weeks in June and July when the temperature approached or exceeded 100°. Plots were maintained in Potter County, University Park, and Lehigh County.

Yields and specific gravity of replicated plots in the three areas are shown in Mills table 1. In addition to the 13 replicated varieties, about 70 selections were grown in single-row plots at each location. About 500 ten-hill lots were grown in Potter County only.

All of the selections shown in table 1 made satisfactory chips, both from 50° storage and after four months in 38-40° storage. They have been rigidly selected for this character. Selection 6HS-9 has consistently been very high yielding in Potter County. However, it literally burned up in the heat of Lehigh County. USDA selection B5141-6 has, over a three-year period, been outstanding in specific gravity and chip color. Yield has been average in Potter County, above average at University Park, and in three very adverse years, top yielding in Lehigh. A higher quality, better chipping variety than Katahdin is very badly needed in the Lehigh area.

Eastern Regional Potato Trials--1966. This trial was planted at University Park May 6, (harvested September 13) in 34-inch rows, seed pieces spaced 12 inches apart. Fertilizer used was about 1000 pounds per acre of 10-20-10. The weather was atrocious; 0.32 inches of rainfall in June, 2.51 inches in July and 0.71 inches in August. Moreover, during the last week of June and the first week of July, temperatures were close to 100°, exceeding 100 on July 3. In spite of three supplemental irrigations of about 1.5 inches each, most varieties were dead by August 17 and all were dead on August 26. Because all died over a period of about two weeks, no attempt was made to rate them for season of maturity. There was no second growth or other growth deformities.

Results are presented in Mills table 2.

Mills table 1. Total yield, percentage over 2 inches, and specific gravity of varieties and selections in three locations. Three replications, 25-foot blocks, 9" spacing.

Variety	<u>Potter County</u>			<u>University Park</u>			<u>Lehigh County</u>		
	<u>Yield</u>	<u>Per Acre</u>	<u>Specific</u>	<u>Yield</u>	<u>Per Acre</u>	<u>Specific</u>	<u>Yield</u>	<u>Per Acre</u>	<u>Specific</u>
	Total	Over 2"	Gravity	Total	Over 2"	Gravity	Total	Over 2"	Gravity
	Cwt.	Pct.		Cwt.	Pct.		Cwt.	Pct.	
6HS-9	431	98	1.082	292	85	1.083	74	62	1.065
Kennebec	405	98	.087	387	93	.079	173	65	.060
6CY-18	380	95	.091	279	67	.091	116	41	--
Pennchip	318	98	.072	204	74	.076	150	80	.065
6MJ-3	305	96	.086	283	93	.097	138	72	--
6JE-5	304	95	.087	212	78	.097	183	79	--
Rus. Rural	295	96	.083	243	70	.089	90	60	.067
Katahdin	250	96	.088	234	90	.079	135	83	.061
Monona	246	94	.084	239	94	.074	120	81	.060
61E-1	245	97	.086	273	88	.091	202	93	.067
6CX-6	228	96	.094	292	81	.094	127	67	.066
61E-6	220	95	.089	295	89	.081	110	76	--
B5141-6	205	96	.106	289	89	.099	194	64	.076
LSD 5%	82			68			31		

Mills table 2. Eastern Regional Potato Trial--1966^{1/}

<u>Variety</u>	<u>Yield Per Acre</u>		<u>Specific Gravity</u>
	<u>Cwt.</u>	<u>Pct.</u>	
Kennebec	340	93	1.0785
B5132-3	339	93	.0707
B5066-3	317	91	.0703
B4829-7	302	96	.0706
B5090-11	298	93	.0657
B5000-18	266	78	.0733
B5088-7	264	87	.0734
B5141-6	245	90	.1003
B5036-40	235	93	.0762
B5052-7	229	94	.0729
Katahdin	224	90	.0785
Mean	282		
LSD .05	35		

^{1/} For other states in trial see page

RHODE ISLAND
Robert S. Bell

Twelve numbered selections and 13 named varieties were included in the 1966 trials. Their specific gravities and yields per acre are shown in Rhode Island table 1. They were grown in Bridgehampton silt loam. There were four replicates of each variety. A low chloride 10-10-10-1.2 fertilizer was banded at planting at 1800 lb/A. The seed piece spacings were 3' x 9". All varieties were dug September 13. The monthly rainfall for May, June, July, and August was 6.66", 2.28", 2.13" and 1.47", respectively.

The tubers were stored in an unheated but insulated cellar. The varieties were checked for chip color on December 6. All varieties developed the desired light colored chips, in the range of 2 to 5 on Coughlin's color chart.

Selection B5141-6 was outstanding for its high specific gravity of 1.094 and a yield comparable to the Katahdin potato.

Rhode Island table 1. Potato variety tests, Kingston, Rhode Island, 1966.

Variety	Specific Gravity ^{1/}	Yield Per Acre U.S. No. 1 ^{2/} Cwt.
Certified seed planted April 26		
Chippewa	70	323 a
Kennebec	72	293 ab
Katahdin	75	255 bc
Green Mountain	89	245 c
Russet Burbank	88	231 c
Irish Cobbler	80	178 d
Home grown seed planted May 6		
Pennchip	73	314 a
Penobscot	88	212 b
B5063-3	84	169 c
Delo	88	114 d
Alaska 114	69	107 d
Alaska Russet	80	96 d
Ona	72	87 d
Rheingold	65	77 d
USDA selections planted May 17		
B4784-1	73	370 a
B5132-3	74	306 b
B5287-16	74	301 b
B5066-3	69	300 b
B4829-7	73	275 bc
B5036-40	75	254 bc
B5282-13	79	243 bc
B5141-6	94	236 c
B5088-7	73	234 c
B5301-7	72	229 c
B5000-18	77	219 c
Katahdin (check)	76	209 c

^{1/} 1.0 omitted from all specific gravity readings.

^{2/} Duncan's multiple range test used to determine varietal significance.

SOUTH CAROLINA
W. R. Sitterly

I. Replicated Yield Trial

Purpose: To obtain horticulturally improved potato varieties adapted to coastal South Carolina.

Procedure: Field C-5 received 700 lbs/A of granular 10-10-10 on January 28. On February 14, seed pieces of test entries were planted 12 inches apart in a randomized block design of 4 replicates, each plot consisting of 1/300 A. Before seed pieces were covered they were sprayed with 3 lbs/A of Eptam. This crop was sidedressed with 50 lbs/A of nitrogen and 30 lbs/A of potassium on March 18. From February 14 to March 18 the season was cold and wet with 1-2 inches of rain every week. Potatoes were harvested May 31.

Results: As shown in South Carolina table 1, LaChipper significantly outyielded all other entries in the test except Pungo. B5141-6 also yielded high. Navajo, B792-94 and Sebago were low yielding.

B5141-6 had the highest DM content and was significantly higher than Ona, PA6H59, Sebago or Monona. Superior and Pungo also had high DM contents.

LaChipper and B5141-6 produced the best stand. This is the third consecutive year these two items have had good germination under extremely adverse conditions.

LaChipper, Superior, B5141-6, and B792-94 did not have any internal defects. All entries had a nice appearing vine except PA6H59, Sebago, B792-94, and Monona. All entries, except Navajo, had acceptable tuber size; and Ona, Navajo, and PA6H59 are considered too late maturing for this area.

Conclusions: In this test, LaChipper was the best performing entry, as it has been for the past several years. After several years of screening, B5141-6 appears promising, particularly concerning yield and DM content. Following is a description of B5141-6 as it appeared in our trials: B5141-6 produces a good stand under adverse environmental conditions. It is an upright plant with a tendency to spread, with broad green leaves of average width. Flowers are blue-white. The maturing season is medium and it produces medium size, oval, white tubers with shallow eyes, crisp white flesh, smooth exterior, and no internal defects.

Navajo, Monona, PA6H59, and B792-94 will be eliminated from our trials. Superior, Pungo, and Sebago are being retained only because of commercial usage.

II. Observational Trial

The information concerning the following ten items was obtained from single plots.

Results and Conclusions: Group performance was good (South Carolina table 2) and indicates close approach to the goal of earliness, yield, high DM content, and ability to withstand adverse environments. B5222-2 and B5219-1 were the best performing entries in this trial. These plus B4783-1 and Keeweenaw will be advanced to 1967 yield trials.

South Carolina table 1. Varietal tuber characteristics of entries in the 1966 potato variety yield trial.

Entry	Yield Per Acre Cwt.	Maturity	Specific Gravity ^{1/}	Stand	Internal Browning Pct.	Size	External Defects
Ona	136	ML	70	Fair	30	Med.	
LaChipper	193	ME	75	Good		Med-lg.	
Navajo	76	ML	76	Poor-Fair	10	Small	
Superior	136	M	80	Fair		Med.	
B5141-6	151	M	90	Good		Med.	
B792-94	97	M	75	Poor		Med.	
Pungo	166	M	78	Fair	20	Med-lg.	
Sebago	100	ME	69	Poor-Fair	10	Med.	Enlarged lenticels
FA6H59	121	ML	71	Fair	50	Large	Secondary growth rough
Monona	112	M	69	Fair	40	Med.	
LSD	34		4.2				

^{1/} 1.0 omitted from specific gravity values.

South Carolina table 2. Varietal tuber characteristics of entries in the 1966 potato observational trial.

Entry	Yield Per Acre Cwt.	Maturity	Specific Gravity ^{1/}	Stand	Internal Defects	Size	External Defects
B3876-2	144	M	75	Fair		Med-lg.	
B5230-1	100	L	75	Fair	30% hollow heart	Med.	Rough
Keeweenaw	163	M	71	Fair		Med.	
Redskin	130	M	76	Poor	10% hollow 30% int.brn.	Large	Deep eyes
B4783-1	151	ME	70	Good		Med.lg.	60% ozone injury
B5219-1	171	M	87	Good		Med.lg.	
B5222-2	190	ME	79	Good		Large	
B4774-8	148	M	78	Good	10% int.brn. yellow flesh	Med.	60% ozone injury
L11-40	151	ME	74	Fair	10% hollow heart	Med.	17% ozone injury
L11-150	136	ME	75	Fair		Med.	30% ozone injury

^{1/} 1.0 omitted from specific gravity values.

TEXAS

B. A. Perry, R. V. Akeley, J. H. Kyle, V. I. Woodfin,
W. R. Cowley, T. D. Longbrake and J. M. Coruthers

Screening and Evaluation of Potato Varieties
and Breeding Lines

The potato program consisted of an evaluation of early breeding lines in observational plots and yield tests of advanced lines in 8 locations. Weather destroyed the yield plantings in 4 of the locations; 3 plantings from too much water and one by hail. Also, a general adaptability test of 8 commercial varieties and 6 breeding lines was grown at Prairie View.

Two red skin breeding lines, DT6063-1R and DT6063-2R, were considered better than the best currently available red variety. These lines produced smoother tubers and have a higher specific gravity than Red LaSoda. The breeding line B5088-7W produced very smooth, long white tubers and has a specific gravity equal to Kennebec. These breeding lines are to be increased as rapidly as possible so that they can be put into commercial evaluation trials over the State. The new commercial variety, Norgold Russet, produced relatively well in most locations, although it did not look as good as it did the previous year. There was some complaint about the small sizes in extreme South Texas. However, it is still the most promising russet variety for commercial planting in Texas.

Texas table 1. Yield tests grown in South Texas.

Variety or Pedigree	Uvalde ^{1/}		San Antonio ^{2/}		Weslaco ^{3/}		Overall Rating ^{5/}	Recommen- dation
	Yield Per Acre	Specific Gravity	Yield Per Acre	Specific Gravity	Yield Per Acre	Specific Gravity ^{4/}		
	Cwt.	^{4/}	Cwt.	^{4/}	Cwt.			^{6/}
Norland	115	56						
B5066-3W	107	56	111	55	114	67	4	R
DT6063-1R	94	70	121	67	126	78	2	A
B5090-11	88	56	111	62	97	65	3	R
Red LaSoda	85	54	93	59	129	65	1	CK
DT5997-2R	85	66	92	68	119	79	3	A
B5088-7W	79	64	109	61	114	68	3	A
DT6063-2R	78	61	107	64	151	75	1	A
Norgold								
Russet	75	67	67	57	108	74	2	CK
BT5210-7	67	63	70	66	106	70	3	A
Kennebec	58	61	50	63	135	70	1	CK
BT5219-1	65	66	59	65	103	79	3	R
B5000-18	61	67	89	70	74	75	5	D
BT5043-2R	49	76	60	70	97	77	2	R
B4808-3W	24	61	59	66	109	68	3	R

^{1/}Planted 2-22-66; Harvested 6-1-66. ^{2/}Planted 3-1-66; Harvested 6-16-66.

^{3/}Planted 1-10-66; Harvested 4-20-66 Fertilized: 60 lbs. N. with O.M. (sorg.)
crop in fall. Sidedressed with 40 lbs. N.

^{4/}1.0 omitted from specific gravity readings. ^{5/}Rating: 1=Excellent; 5=poor
Irrig. 3/24 and 4/8.

^{6/}A=advance, R=repeat, D=drop CK=use as commercial check variety.

Texas table 2. Yield test grown in Prairie View, Texas

Variety or Pedigree No.	Marketable Yield Per Acre	Variety or Pedigree No.	Marketable Yield Per Acre
	Cwt.		Cwt.
Ona	62	B4829-7	60
Pungo	67	Sebago	35
TL7935	88	LaChipper	50
B5088-7	34	TL8134	35
Kennebec	75	5066-3	58
Merrimack	53	Cherokee	49
TL8117	31	Katahdin	43

Texas table 3. Yield of varieties and seedlings grown in Knox County, Munday, Texas^{1/}

Pedigree No.	Yield Per Acre			Total	Specific Gravity ^{2/}
	Jumbo (Over 12 oz.)	No. 1	No. 2 (Under 2" dia.)		
	Cwt.	Cwt.	Cwt.	Cwt.	
B5446-4	17	271	20	309	74
B4808-3	47	296	33	377	74
B5090-11	24	271	27	324	72
B5267-2	15	332	26	374	81
B5066-3	37	289	34	361	76
B5400-8		235	43	278	84
B5043-2	4	194	48	246	81
BT5404-2	1	227	45	275	82
BT5218-6	45	162	13	222	83
BT5210-7	34	156	27	218	77
BT5218-7	12	178	25	216	81
BT5219-1	20	299	45	365	89
DT6063-1R	26	279	27	333	89
DT6063-2R	22	190	23	235	80
DT5997-2R	12	227	33	272	82
BT5088-7	14	258	31	304	75
BT5000-18	1	263	31	297	83
48-1	48	296	24	369	80
8197	3	245	31	280	74
5302-3		189	24	213	70
177-13	6	334	33	374	70
3620-1	16	304	23	344	75
7627	56	306	17	380	80
Norgold Russet	2	244	51	297	78
Red LaSoda	51	407	23	481	74
Cherokee	12	367	29	409	79
Kennebec	56	248	40	345	76
Commercial Check NR	18	228	63	310	84

^{1/}Texas Agricultural Experiment Station, Texas Agricultural Extension Service,

United States Department of Agriculture and Munday Vegetable Growers Cooperating.

^{2/}See footnote 4, table 1.

Texas table 4. Tuber characteristics of varieties and seedlings grown in Knox County, Munday, Texas^{1/}

Pedigree Number	Overall Rating ^{2/}	Skin	Smoothness	Shape	Eye	Size	3/ Remarks
B5446-4	3+	W	S	Round to oblong	S	M to L	R
B4808-3	3	Light P	MR	Oblong round	MD	M to L	D
B5090-11	3+	W	S	Oblong round	S	M to L	R
B5267-2	3	W	M	Oblong & flat	M	M to L	R
B5066-3	3+	W	S	Oblong & round	S	S to L	R
B5400-8	3	W	MS	Oblong & flat	S	Medium	D
B5043-2	3+	Medium R	S	Oblong & flat	S	S to M	D
Bt5404-2	3	W	MS	Oblong	S	S to L	D
Bt5218-6	4	W	S	Oblong round	S	S to L	D
Bt5210-7	3	W	M	Oblong Irreg.	M	S to L	D
Bt5218-7	3	W	M	Oblong to long	M	M to L	D
Bt5219-1	3	W	S	Round to oblong	S	S to L	R
Dt6063-1R	4	Medium Deep Rd	S	Oblong	S	Large	R
Dt6063-2R	2+	Light Red	M	Oblong	M	Large	R
Dt5997-2R	2+	Red	M	Round to oblong	S	M to L	D
Bt5088-7	3+	W	S	Round to oblong	S	S to L	R
Bt5000-18	3+	W	S	Oblong & flat	S	Medium	R
48-1	3	W	MR	Oblong to long	M	Large	R
8197	4	Medium R	S	Round to oblong	M	M to L	D
5302-3	3+	Deep Russet	S	Oblong to long (flat)	S	Medium	R
177-13	3	Med. to Lt. Red	M	Oblong round	M	Medium	R
3620-1	3+	W	M	Round	M	M to L	D
7627	4+	W	S	Oblong round	S	M to L	D
Norgold Russet	4	Russet	S	Round oblong	S	S to M	
Red LaSoda	3	Med. to Red	MS	Oblong round	MD	M to L	
Cherokee	2	W	R	Round irreg.	MD	Medium	
Kennebec	3+	W	M	Round to oblong	S	M to L	
Commercial Check NR	4+	Russet	S	Oblong round	S	M to L	

^{1/} Texas Agricultural Experiment Station, Texas Agricultural Extension Service, United States Department of Agriculture, and Munday Vegetable Growers Cooperating.

^{2/} See footnote 5, table 1.

^{3/} See footnote 6, table 1.

Texas table 5. Tuber characteristics of seedlings grown in Knox County, Munday, Texas^{1/}

Pedigree Number	Overall Rating ^{2/}	Skin	Smoothness	Shape	Eye	Size	Remarks ^{3/}
B5304-42	3	W	MS	Oblong & round	M	M to L	
B5415-6	3+	W	MS	Round to oblong	S	S to L	
B5415-14	3	W	R	Oblong & flat	M	S to L	D
B5502-2	3	W	R	Round to oblong	M	S to L	D
B5445-12	3	W	MS	Round to oblong	M	M to L	R
B5433-8	2+	Deep Russet	M	Oblong	S	S to M	D
B5422-9	2+	W	R	Round to oblong	M	S to L	D
B5446-4	2+	W	MR	Oblong	M	S to L	D
B5429-1	2+	W	MR	Oblong (flat)	M	M to L	D
B5458-6	2+	Russet	MR	Oblong, irreg.	S	S to L	D
B5463-15	3	W	S	Long & flat	S	M to L	D
B5395-7	2+	W	MS	Oblong to long-flat	S	S to M	D
B5422-6	2	W	MR	Oblong (flat)	S	S to L	D
B5299-39	2+	W	MR	Oblong	M	S to L	D
B5458-3	3	W	MS	Oblong (flat)	S	S to L	D
181-25	2+	W	MR	Oblong (flat)	Med. D	S to M	D
181-57	2+	W	R	Oblong (flat)	S	M to L	D
G404-50	3	W	M	Oblong (flat)	M	M to L	D
G404-27	3	W	M	Round to oblong	M	Medium	D
G412-10R	3+	Medium R	M	Oblong to long	M	Large	R
G422-21	3+	W	S	Oblong to long	S	Medium	R
179-12	3	W	M	Round	S	M to L	R
G422-23	3+	W	S	Round and oblong	S	M to L	R
G421-24	2+	W	R	Round and irreg.	D	M to L	D
G404-35	2+	W	M	Round to oblong	S	S to L	D
G419-4R	3	R	M	Oblong and round	S	S to L	D
G422-5	2+	W	M	Round to oblong	M	S to L	D
G412-18R	4	Deep R	M	Oblong and flat	S	M to L	R
G404-57	3	W	M	Round to oblong	M	S to L	D
G412-12R	3+	R	S	Round & thick	S	M to L	D
148-1	2+	W	S	Round and long	S	S to M	D
148-2	3+	W	S	Round	S	Medium	D
5863-2	3	W	M	Round	M	Medium	D
5628-1	3+	R	S	Round to oblong	S	Medium	D
6407	3	W	S	Oblong to long	S	S to M	D

Specific Gravity of Lines to be Repeated:

Pedigree Number	Specific Gravity	Pedigree Number	Specific Gravity
179-12	1.081	G412-18R	1.061
G422-21	1.089	G422-23	1.082
G412-10R	1.074	B5304-42	1.080
B5445-12	1.072	5814	1.091
B5415-6	1.083	57410	1.077

^{1/}Texas Agricultural Experiment Station, Texas Agricultural Extension Service, United States Department of Agriculture, and Munday Vegetable Growers Cooperating.

^{2/}See footnote 5, table 1.

^{3/}See footnote 6, table 1.

TEXAS (Campbell Soup Company)
R. D. Peel, R. V. Akeley and C. E. Cunningham

Cooperative Testing of Potato Varieties for Use in Soups

Potato variety trials were conducted in five locations in 1966.

San Antonio (Bexar County). Variety B5066-3 was the highest yielding variety in this test and was significantly higher yielding than any of the named varieties. The quality of the tubers was also very good. Variety B5088-7 was the next highest yielding and was significantly higher yielding than Kennebec. All the numbered varieties in this trial were as good as or better than Kennebec in yield (Peel table 1).

Munday (Knox County). The yields of all the varieties at this location were very good and most of the varieties produced 90% or over of No. 1 tubers. All but six of the numbered varieties yielded as well as or better than Kennebec. Variety B5141-6 was again high in specific gravity with an average of 1.092 (Peel table 2).

Direct (Lamar County). Several numbered varieties yielded as well as Kennebec, although only two were higher yielding. The varieties that have looked best in the past were all in this category; B5090-11, B5036-40, B5141-6, B5088-7, and B5066-3. This area produced the highest dry matter of all the test areas. Variety B5141-6 averaged over 1.103 in specific gravity (Peel table 3).

Lubbock (Lubbock County). The plots at this location were almost completely destroyed by hail on June 10. After a delay of about two weeks, top growth was re-established. When the plots were harvested, six weeks after the hail, respectable yields were obtained although there were many small and misshapen tubers; the overall rating shown in Peel table 4 reflects this.

Hale Center (Hale County). Again most of the numbered varieties were as good as or better than Kennebec in total yield. Most of the varieties graded 90% No. 1 tubers at this location. The yield of B5141-6 was significantly greater than that of Kennebec, and its specific gravity was significantly greater than that of any other variety in the test (Peel table 5).

Peel table 1. Total yield, yield over 2 inches, specific gravity and overall rating of varieties grown at San Antonio, Texas, 1966.

Variety	Yield Per Acre		Specific Gravity ¹	Overall Rating ²	Variety	Yield Per Acre		Specific Gravity ¹	Overall Rating ²
	Total	Over 2"				Total	Over 2"		
	Cwt.	Pct.				Cwt.	Pct.		
B5066-3	195	90	58	3+	B5287-16	154	91	66	3
B5088-7	169	90	60	2+	Katahdin	150	86	63	2
B5282-13	163	77	67	2+	B5253-31	149	88	60	2+
B5301-7	161	88	59	3-	B5036-40	146	89	63	2
B5090-11	159	86	60	2	B5132-3	137	86	59	2
B5236-8	159	88	60	3-	B4829-7	135	94	60	3

continued

Peel table 1 continued.

Norland	132	90	52	2
Kennebec	125	85	70	2
Redskin	105	65	73	1
Merrimack	70	71	73	1
LSD	.05	33	9	5
	.01	44	12	7
c.v.	16%	7%		

Planting date - February 28 Plot size - 2 rows, 10 feet long
Harvest date - June 16 Plot design - Randomized block
Row spacing - 36 inches Replications - 4
Plant spacing - 12 inches Fertilizer - 800# 16-20-0

1/ 1.0 omitted from all specific gravity readings.

2/ 1 - poor to 5 - good.

Peel table 2. Total yield, yield over 2 inches, specific gravity and overall rating of varieties grown at Munday, Texas, 1966.

Variety	Yield Per Acre		Specific Gravity ^{1/}	Overall Rating ^{2/}	Variety	Yield Per Acre		Specific Gravity ^{1/}	Overall Rating ^{2/}
	Total	Over 2"				Total	Over 2"		
	Cwt.	Pct.				Cwt.	Pct.		
Redskin	465	96	73	3-	B5422-6	330	91	69	3
B4784-1	444	91	61	3	B5459-1	330	89	85	4
B5036-40	422	91	74	3+	B5236-8	329	94	70	4
Reliance	419	95	70	3+	Penobscot	325	95	83	3
B5066-3	415	95	69	4+	B5282-13	322	89	80	4
B5422-9	390	93	72	4	Katahdin	316	89	73	3+
Kennebec	374	92	73	3	B5253-31	303	95	71	4
B5088-7	372	89	69	4	B5301-7	302	89	66	4
B5090-11	354	92	64	4	B5400-8	301	85	82	3+
B5089-18	353	80	70	3	B5287-16	294	95	72	3+
B5415-6	349	89	77	3+	Nor. Russet	292	87	74	4+
B5132-3	337	92	69	4	B4829-7	273	93	66	4+
B5141-6	335	93	92	3	B5458-3	272	91	71	4
L.S.D .05	66	4.4	4						
	.01	89	5.8	5					
c.v.	14%	3%							

Planting date - February 25 Plot size - 1 row, 25 feet long
Harvest date - June 15 Plot design - Randomized block
Row spacing - 38 inches Replications - 4
Plant spacing - 12 inches Fertilizer - 800# 16-20-0

1/ See footnote 1, table 1.

2/ 1 - poor to 5 - good.

Peel table 3. Total yield, yield over 2 inches, specific gravity and overall rating of varieties grown at Direct, Texas, 1966.

Variety	Yield Per Acre		Specific Gravity	Overall Rating ^{1/}	Variety	Yield Per Acre		Specific Gravity	Overall Rating ^{1/}
	Total	Over 2"				Total	Over 2"		
	Cwt.	Pct.				Cwt.	Pct.		
B4784-1	273	87	1.065	3	B5236-8	200	86	78	3
Redskin	255	87	.82	2	B5287-16	198	88	73	2+
B5090-11	247	82	.70	2+	B5132-3	198	89	78	3
B5036-40	230	83	.83	3	B5458-3	192	85	78	2+
B5141-6	230	78	1.03	2+	Nor. Russet	191	73	84	2+
Reliance	222	86	.80	2+	B5089-18	188	69	79	2
Kennebec	219	85	.79	2+	B5282-13	187	74	87	2+
B5088-7	212	74	.78	2+	B5459-1	186	68	93	2
Penobscot	210	81	.93	2	B5253-31	183	70	75	2
B5415-6	207	83	.81	2+	B4829-7	175	89	76	2
B5066-3	203	76	.77	3	B5301-7	164	75	78	2+
B5422-9	201	77	.82	3	B5422-6	162	62	1.085	2
Katahdin	201	78	.78	3+					
L.S.D. .05	27	4.3	.003						
.01	36	5.7	.004						
c.v.	9%	4%							

Planting date - March 1	Plot size - 2 rows, 20 feet long
Harvest date - June 20	Plot design - Randomized block
Row spacing - 36 inches	Replications - 4
Plant spacing - 12 inches	Fertilizer - 900# 16-20-8

1/ 1 - poor to 5 - good.

Peel table 4. Total yield, yield over 2 inches, specific gravity and overall rating of varieties grown at Lubbock, Texas, 1966.

Variety	Yield Per Acre		Specific Gravity ^{1/}	Overall Rating ^{2/}	Variety	Yield Per Acre		Specific Gravity ^{1/}	Overall Rating ^{2/}
	Total	Over 2"				Total	Over 2"		
	Cwt.	Pct.				Cwt.	Pct.		
B5236-8	254	89	.68	3+	Nor. Russet	192	46	.66	2+
Redskin	247	84	.63	3	B5282-13	187	59	.67	2
Reliance	229	82	.63	2	Katahdin	185	66	.62	1+
B5132-3	218	83	.62	2	B5301-7	184	70	.62	2
B5141-6	218	77	.83	2	B4784-1	183	63	.50	2
Haig	211	63	.64	3	B5090-11	181	54	.51	1+
B5415-6	209	60	.64	1+	B4829-7	179	89	.57	2+
B5036-40	209	77	.68	2	Kennebec	177	66	.62	2
B5459-1	204	62	.75	2	B5253-31	163	64	.58	2
B5066-3	201	73	.57	1+	B5287-16	161	74	.57	2
B5438-3	200	79	.66	2+	B5089-18	160	44	.64	1+
B5422-9	198	63	.59	1+	B5088-7	156	68	.61	1+
L.S.D. .05	40	9	.4		Penobscot	117	57	.71	1
.01	53	12	.6						
c.v.	15%	9%							

Planting date - March 19	Plot size - 1 row, 25 feet long
Harvest date - July 21	Plot design - Randomized block
Row spacing - 38 inches	Replications - 4
Plant spacing - 12 inches	Fertilizer - 700# 16-20-0

1/ See footnote 1, table 1. 2/ 1 - poor to 5 - good.

Peel table 5. Total yield, yield over 2 inches, specific gravity and overall rating of varieties grown at Hale Center, Texas, 1966.

Variety	Yield Per Acre		Specific Gravity ^{1/}	Overall Rating ^{2/}
	Total	Over 2"		
	Cwt.	Pct.		
B4784-1	436	90	51	1+
B5141-6	422	94	84	4.
Redskin	386	92	62	3
B5415-6	377	94	68	3+
Reliance	351	93	60	2+
B5132-3	345	92	60	3.
B5282-13	340	94	66	3+
B5236-8	331	97	61	4.
Kennebec	318	92	61	4
B5036-40	317	89	62	3-
Katahdin	316	94	60	3+
B5089-18	311	85	60	2+
Norgold Russet	305	87	63	3.
B5459-1	297	93	73	2+
Penobscot	289	94	77	3+
B5090-11	285	87	56	2+
B5422-6	283	92	65	3.
B5422-9	283	84	64	2
B5066-3	283	90	60	2+
B5287-16	278	96	62	3+
B5400-8	264	78	70	2.
B4829-7	263	96	60	3
B5088-7	257	93	61	2+
B5253-31	241	87	57	2.
B5301-7	218	88	60	2
B5458-3	175	95	58	2
L.S.D .05	66	6	4	
.01	88	8	5	
c.v.	15%	5%		
Planting date - April 15				
Harvest date - September 14				
Row spacing - 38 inches				
Plant spacing - 12 inches				
Plot size - 1 row, 25 feet long				
Plot design - Randomized blocks				
Replications - 4				
Fertilizer - 350# 12-44-7				
250# Ammonium Sulfate				

^{1/} See footnote 1, table 1.

^{2/} 1 - poor to 5 - good.

VERMONT

Samuel C. Wiggans, Wilfred R. Kelly
Richard Jensen, and Hugh Murphy

During 1966 three variety trials containing 16 entries each were conducted in Vermont at Hardwick, Burlington, and Westminster. There were five replicates in a randomized block design at each location. Seed pieces of all varieties were set by hand 9 inches apart in the row except Norgold Russet which was spaced 12 inches between seed pieces. This was part of the tri-state cooperative variety trial in the National Potato Breeding Program.

The plots at Hardwick were planted on May 18 and harvested September 13. Fertilizer was applied at the rate of 135-270-270 per acre. The potatoes were planted on a very light soil at Hardwick. This, combined with a general lack of moisture during the growing season, resulted in relatively low yields (Vermont table 1).

The plots at Burlington were planted on May 25 and harvested September 21. Fertilizer was applied at the rate of 70-70-70 per acre. The potatoes were planted on a light soil; however, irrigation was supplied to supplement the summer rainfall so that a minimum of 1 inch of moisture per week was available for plant growth. There was only one spray application of an insecticide. No fungicide was applied (Vermont table 2).

The plots at Westminster were planted May 4 and harvested September 27. Fertilizer was applied at the rate of 120-240-240 per acre. The potatoes were planted on a medium loamy soil. A systemic insecticide was applied at the time of planting. Adequate moisture throughout a relatively long growing season resulted in higher yields than at the other two Vermont locations (Vermont table 3).

The new seedlings B5141-6 and RD 45 appear to have possibilities as a selection for Vermont potato growers. They are expected to be included in future trials.

Shoshoni appeared to yield well in Vermont trials although it was low in specific gravity and showed poor chip color in all trials.

Vermont table 1. Yield, specific gravity, and chip color for 16 potato varieties grown at Hardwick, Vermont, 1966.

Variety	Yield Per Acre			Specific Gravity	Chip Color
	Above	1-7/8 to 4	2-1/2 to 4		
	1-1/2 inches	inches	inches		
	Cwt.	Pct.	Pct.		
Kennebec	256	97	88	63	8.4
B5036-40	248	94	75	59	8.9
B5066-3	246	97	86	58	9.7
RD 45	225	95	69	66	6.9
B5088-7	221	94	73	54	10.0
Shoshoni	214	97	86	57	10.0
B5006-15	214	94	72	62	10.0
Pennchip	208	88	52	63	6.8
Grand Falls	201	97	76	69	7.6
B5000-18	198	96	82	56	9.9
Norgold Russet	196	63(4-10 oz)		63	9.9

continued

Vermont table 1, continued.

B5141-6	192	94	70	78	6.4
Katahdin	185	94	70	61	9.3
Monona	172	93	69	60	6.1
B4744-23	153	93	64	70	8.8
B5052-7	149	95	74	54	10.0
L.S.D. 0.05	24			02	
0.01	33			03	

1/ 1.0 omitted from specific gravity values.

2/ Chips with lower index are lighter in color.

Vermont table 2. Yield, specific gravity, and chip color for 16 potato varieties grown at the University of Vermont, Burlington, Vermont, 1966.

Variety	Yield Per Acre			<u>1/</u> Specific Gravity	<u>2/</u> Chip Color
	Above 1-½ inches	1-7/8 to 4 inches	2-½ to 4 inches		
	Cwt.	Pct.	Pct.		
Shoshoni	314	96	80	70	8.3
B5141-6	287	86	49	96	4.4
Kennebec	280	95	60	80	5.6
RD 45	266	89	36	80	5.3
B5066-3	265	87	47	69	6.6
Monona	259	89	52	69	3.6
B5036-40	258	92	68	70	5.0
Katahdin	244	94	62	79	5.4
Grand Falls	236	95	61	81	4.8
B 5088-7	236	82	33	68	7.8
Norgold Russet	223	39 (4-10 oz.)		75	10.0
B5006-15	219	73	17	73	6.8
B5000-18	216	80	33	71	6.8
B5052-7	213	92	62	71	7.8
Pennchip	200	74	30	79	5.0
B4744-23	185	87	43	78	6.2
L.S.D. 0.05	37			02	
0.01	49			03	

1/ See footnote 1, table 1.

2/ See footnote 2, table 1.

Vermont table 3. Yield, specific gravity, and chip color for 16 potato varieties grown at Westminster, Vermont, 1966.

Variety	Yield Per Acre			Specific Gravity	1/ Chip Color
	Above	1-7/8 to 4	2-1/2 to 4		
	1-1/2 inches	inches	inches		
	Cwt.	Pct.	Pct.		
Kennebec	517	87	81	64	7.9
Katahdin	516	87	80	65	8.6
Shoshoni	484	83	78	60	10.0
B5066-3	456	93	85	60	8.8
RD 45	456	94	86	64	6.9
B5141-6	449	96	86	81	6.6
Pennchip	438	90	79	64	6.5
Grand Falls	437	96	83	68	7.4
B5088-7	437	92	81	57	9.9
B5006-15	426	97	84	64	9.2
B5036-40	421	93	80	62	7.3
Monona	419	87	79	59	5.1
Norgold Russet	406	52 (4-10 oz.)		63	9.0
B5000-18	387	95	87	62	9.3
B5052-7	325	97	87	57	9.9
B4744-23	281	94	80	66	8.2
L.S.D. 0.05	72			03	
0.01	96			04	

1/See footnote 1, table 1.

2/See footnote 2, table 1.

VIRGINIA

M. M. Parker, E. Mapp Dunton, Jr., Virginia Truck Experiment Station
James Watts, Wise Potato Chip Company

Twenty-two seedling selections from the National Potato Breeding Program, four popular local commercial varieties, and four recently introduced ones, whose performance in Virginia is unknown, were planted at Painter on the Eastern Shore of Virginia, and a duplicate planting was made at Norfolk.

In the tests dealing with the commercial kinds at Painter, one planting of the varieties was kept watered to 50% available moisture and above to maintain uninterrupted plant growth and a second received no water other than rainfall. In this same test the varieties Pungo and Haig were planted with certified seed produced in out-of-state areas and also with seed grown locally. The latter is called "home-grown" and is produced by planting certified seed in mid-summer for late October harvest. Only the first generation of home-grown seed is considered worth planting for commercial purposes because after that, later generations become greatly weakened from various causes, and more than likely will produce inferior yields.

Home-grown seed is not used exclusively to grow the local commercial crop because this seed usually comes up later than seed grown in other places and because the plants frequently mature later. The yield of potatoes produced by home-grown seed, however, may be just as large as that produced by seed from other sources, particularly if favorable growing weather occurs during the last two or three weeks of the season.

Cultural Practices

A 10-10-10 fertilizer mixture was broadcast and disked into the surface of the soil at the rate of 1000 pounds to the acre just before planting the test plots. The plantings were made at both of the locations about the middle of March and they were harvested the first week of July.

In the irrigated and non-irrigated variety test at Painter, the rows were spaced at the usual commercial distance of 36 inches. The rows were 50 feet long and there were four replications of each treatment. This test was planted by machine which puts the seed pieces 12 to 14 inches apart.

The seedling lots were put in single rows 40 feet long with 4 feet between rows. The seed pieces were dropped by hand 12 inches apart in the row. The wide spacing between rows was for the double purpose of giving the large-vine, late-maturing seedlings plenty of room in which to develop and to make it easier to observe and record plant growth characteristics up to maturity. Yields from these wider rows, given on an acre basis in Virginia table 2, are therefore less than they would be if put at the closer commercial distance.

Sprinkler type irrigation was used to keep the seedling selections well watered until the end of the growing season.

Climatic Conditions

Ordinarily, because potato seed is planted in late winter in Eastern Virginia, at times, when the soil may be practically at seed storage temperatures, plant emergence is usually strung out over a long period of time. In 1966, however, the soil stayed warm following planting and all plants were above ground in less than 30 days after planting. After the plants were up, conditions were also favorable for a good set of tubers and for good plant growth thereafter. The length of the growing season, as measured by the length of time it took the early kinds to mature, however, was somewhat short.

Results from the Variety Test

Pungo, planted with both home-grown and certified seed, with and without irrigation, produced the largest yield of all four entries (Virginia table 1). This was not unexpected because Pungo always has been a leader in productivity and its popularity among Virginia growers is partly based on that fact. Sprouting of the maturing tubers in the field and misshapen potatoes which are formed by the Pungo when the growing season is very hot and dry, are its principal faults, and even though the imperfections occur at infrequent intervals it has become necessary to try to find varieties without these faults and which would have the capacity to yield as well as the Pungo and have its other good qualities.

Norgold Russet, which has been grown commercially in Virginia in limited amounts only for the past couple of years, gave yields slightly less than that produced by Pungo. This variety, unlike the Pungo, seems to be suitable only for fresh market purposes since chipping tests, to date, indicate that it does not make the kind of chips that the processors of Virginia potatoes are looking for. Its oblong shape and russeted skin, however, appeals to a number of local growers producing potatoes particularly for the fresh market trade.

Haig, usually produces lower yields than all other varieties grown on a commercial scale in Virginia, so its low yield in the test plots was anticipated. It is liked by some, in spite of its incapacity for top yields, because it is very early in maturity and because it forms nice looking, medium size tubers which make a very good appearance in consumer size packages. It also makes chips of good color and in addition, will not field sprout or produce misshapen potatoes under adverse growing conditions.

Superior, the fourth variety in the test, whose use in Virginia is on the increase because of its capacity to produce good yields of early maturing tubers suitable for both fresh market purposes and for processing into chips, and because it is free of field sprouts and second growth bumps, gave low yields in the 1966 tests. Prior to this year's tests, Superior gave good yields even though they were below those produced by Pungo. Superior usually will produce small yields only when it is planted in light sandy soils, or when insufficient fertilizer is within utilization distance of the plants. In 1966, the fertilizer was broadcast instead of band placed which may have contributed to Superior's low productivity.

Results from the Seedling Tests

Several of the seedlings in the 1966 planting produced yields just as good as those from the best of the standard commercial varieties but in most cases they lacked one or more of the other horticultural properties that are essential for the successful growing and marketing of potatoes in Virginia, such as a combination of earliness of maturity, favorable appearance for fresh use, good table quality and suitability for processing into chips. For instance, B4557-2 and B4828-4 were fourth and sixth in yield in the average of the plantings at the two locations but the first of these was very late in maturity (it was in full bloom at the time some of the other lots were beginning to mature) and, in addition, had the fault of making dark colored chips. On the other hand, B4828-4, an early-maturing, good looking pink-eyed lot, had an off-flavor when cooked and this, together with its poor chip color and low dry matter content tended to eliminate it from further consideration.

Conversely, B4808-8 and F5208, while not among the leaders in productivity, possessed many other desirable features that would help them to become popular with local commercial growers. For instance, they were both attractive in appearance and they both made good, light colored chips over a long period of storage--two primary requisites. In addition, in 1965, under growing conditions that caused other varieties to form long, green sprouts on tubers in the field and second growth bumps, neither B4808-8 or F5208 had these grade reducing disfigurements. They therefore seem to have high potential value for production in Virginia. Another lot, B4093-2, while not in tests prior to 1966, showed up well both in chipping tests and in dry matter content when grown at Norfolk. It was not highly productive in the 1966 test but nevertheless it might have value because of its other qualifications.

The two selections ND3022-18 and B725-61 which had appeared to be superior to other seedlings in earlier plantings became questionable in value at the end of the 1966 tests because the yield from ND3022-18 was very low and because B725-61 had a very low dry matter content and also made chips of inferior color.

Chip Color and Specific Gravity over a Nine-week Storage Period

Samples were stored at an average temperature of 70° F. at an average relative humidity of 50%. Chip color was determined by frying raw slices from four tubers at weekly intervals during the storage period. Specific gravity measurements were made on five occasions during the storage period. The specific gravity as reported is the average of these five determinations.

Norfolk Location

The chip color produced by the varieties and seedlings grown at the Norfolk location (Virginia table 3) was generally light and satisfactory with the following exceptions: B5000-18, B4828-4, B4829-7, Morgold Russet. There was considerable variation in the specific gravity. On a relative basis, the varieties and seedlings could be listed in the following categories:

<u>Very High and High</u>	<u>Medium</u>	<u>Low and Very Low</u>
B5141-6	Penn. 6HS-9	B4829-7
B4557-2	Platte	B4828-4
B5208	B5031-18	Hi-Plains
B4093-2	Superior	ND3022-18
	Pungo	
	Norgold Russet	
	Monona	
	Haig	

Painter Location

The chip color produced by the varieties and seedlings grown at Painter (Virginia table 3) was also generally satisfactory with the following exceptions:

B4557-2	B4828-4
B725-61	Norgold Russet

The specific gravity of the samples from the Painter location was generally higher than the specific gravity of the lots grown at Norfolk. The variation also was somewhat less. On a relative basis the selections could be grouped as follows:

<u>Very High and High</u>	<u>Medium</u>	<u>Low and Very Low</u>
B5141-6	Superior	Monona
B4557-2	B4808-8	ND3022-18
F5208	6HS-9	B4828-4
	Norgold Russet	
	Platte	
	Haig	
	B5036-40	
	Hi-Plains	

Quality-wise the USDA seedling B5141-6 was the outstanding selection from each location. The specific gravity was abnormally high and the chip color was very light throughout the nine-week storage period.

The Canadian seedling F5208 was also impressive; however, the specific gravity, although high, was lower than that of B5141-6.

The variety Superior was impressive. The specific gravity was in the high range and the chip color was light throughout the storage period.

The variety Monona produced chips of very light color during the entire nine-week storage period, however, the specific gravity was in the medium-low range.

Based on both chip color and specific gravity the following seedlings, in addition to B5141-6 and F5208, appear to hold some promise for the Eastern Shore area and should be tested more extensively. They are Penn. 6HS-9, B5036-40, B4808-8, and B4093-2 along with the varieties Haig and Platte.

The following seedlings do not appear to hold any promise, at least not as selections suitable for processing when grown in the Eastern Shore area: B5000-18, B4828-4, B725-61, B4829-7, B4557-2, or Norgold Russet.

Virginia table 1. Potato Variety test at Painter, Virginia, 1966^{1/}

Variety	Yield Per Acre						Specific Gravity		Weight of 75	
	Irrigation ^{3/}			No Irrigation			3/ Irrigation	No Irrigation	4/ Irrigation	No Irrigation
	A Size	B Size	Total	A Size	B Size	Total				
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.				
Pungo (Home-grown seed)	196 a	18	214	175 a	17	192	70 a	76 a	28 a	30 a
Pungo (Northern seed)	193 a	14	207	166 a	16	182	71 a	77 a	29 a	31 a
Norgold Russet (Northern seed)	177 a	31	208	164 a	25	189	70 a	75 a	25 b	23 b
Haig (Home-grown seed)	125 b	26	151	93 b	27	120	63 a	70 c	21 c	20 b
Superior (Northern seed)	114 b	13	127	90 b	13	103	68 a	72 b	24 b	23 b
Haig (Northern seed)	82 c	27	109	56 c	22	78	65 a	71 c	19 c	19 b

^{1/} Values with a common letter are not significantly different ($P = .01$).^{2/} 1.0 omitted from specific gravity values.^{3/} Differences due to irrigation are significant ($P = .01$); variety x irrigation interaction is non-significant ($P = .01$).^{4/} Differences due to irrigation and variety x irrigation interaction are non-significant ($P = .01$).

Virginia table 2. USDA and miscellaneous seedling potato lots grown at Norfolk and Painter, 1966.

Variety	Average	Total Yield ^{1/} Per Acre		Variety	Average	Total Yield ^{1/} Per Acre	
		Norfolk	Painter			Norfolk	Painter
	Cwt.	Cwt.	Cwt.		Cwt.	Cwt.	Cwt.
B5090-11	209	198	220	B5052-7	151	136	166
B5088-7	198	214	182	B5141-6	151	166	136
B5063-3	193	190	196	B5011-17	147	120	174
Hi-Plains ^{2/}	191	185	197	B5089-17	145	147	144
B4557-2	190	215	165	B5000-18	141	127	155
B5066-3	181	196	166	B4808-8	139	128	150
Penn. 6HS-9	179	217	141	Platte ^{2/}	129	125	133
B4828-4	175	177	174	ND3022-18	126	127	125
B2894-24	173	177	169	B4829-7	118	95	142
B5036-40	172	152	193	Monona	117	131	103
B725-61	171	169	174	B5031-18	115	92	138
B4093-2	158	174	142	B4088-4	81	79	84
F5208	153	144	163	B4093-11	59	68	51

^{1/} Total yield from 4-foot wide rows.

^{2/} Planted one week later than other lots. Seed furnished by Dr. Robert O'Keefe, University of Nebraska.

Virginia table 3. Average chip color and specific gravity taken at weekly intervals over a period of nine weeks of varieties grown at Norfolk and Painter^{1/}

Variety	Norfolk		Painter	
	Chip Color ^{2/}	Specific Gravity ^{3/}	Chip Color ^{2/}	Specific Gravity ^{3/}
B5141-6	1.2	91	1.0	95
Monona	1.6	69	1.2	66
Superior	1.6	72	1.2	77
Penn. 6HS-9	1.8	73	1.3	76
F5208	1.8	83	1.2	83
Platte	2.3	72	1.4	73
B4093-2	2.3	78	-	-
Hi-Plains	2.6	63	2.0	70
Pungo	2.6	71	-	-
Haig	2.7	67	1.4	70
B5036-40	-	-	1.4	71
B5093-11	2.7	57	-	-
B4804-8	-	-	1.4	77
B4808-8	2.8	73	1.4	77
ND3022-18	2.9	65	1.4	67
B5031-18	3.3	73	-	-
B5090-11	-	-	1.8	61
B4557-2	3.9	85	4.6	84
B4093-11	4.1	57	-	-
B5000-18	4.7	70	-	-
B725-61	-	-	5.6	62
B4829-7	5.1	66	-	-
B4828-4	6.3	65	6.0	65
Norgold Russet	7.0	72	7.2	76

^{1/} Tests conducted by James Watts, Wise Potato Chip Co.

^{2/} Chip color key: 1-4, acceptable; 5, usable; 6-14, unacceptable.

^{3/} 1.0 omitted from specific gravity values.

WASHINGTON
Wm. G. Hoyman

Eight russet parents were used in 1966 to obtain over 1,000,000 seeds from 18 parental combinations. The selection 168-3 was used extensively as a male parent. This selection has a high specific gravity (1.114) and is resistant to the pathogens causing common scab, late blight and verticillium wilt.

Fifty thousand seedlings were grown in 2 screenhouses. These were transplanted in May and harvested in September.

A 9-acre field of seedlings was grown at Prosser. Sixty-nine hills were selected for further evaluation. An additional 32 hills containing a large number of small, round tubers were selected for a food processor. Number of tubers in these hills varied from 21 to 46.

Two hundred pounds of seedling tubers were sent to the Northwest Montana Experiment Station, Creston, Montana.

Forty-seven russet and 6 white selections were tested for resistance to the pathogens causing verticillium wilt and common scab. They were also harvested at early and late dates. Selections 205-10, 221-5, 226-2, 245-2 and 245-9 will be evaluated further and included in the 1967 Prosser yield trial.

Montana selections 594-3, 5959-3, 5978-3, 5979-1, 6024, 6031, 6053 and 6083 were included in the verticillium wilt trial. All were susceptible to the sclerotial form of Verticillium albo-atrum. 5959-3 was the last to die and it had the best tuber type.

The seed increase plot at Blockhouse, Washington, included all Washington selections in the wilt trial and some advanced selections. A 4-month growing period at this high-altitude location permitted a satisfactory increase of all selections saved for further evaluation.

Selection 48-1 has been tested at various locations the past few years. This white-skinned potato has resistance to the leafroll virus and Verticillium albo-atrum. Preliminary tests have shown that it was not susceptible to virus X. Blackleg has not been observed on it at some locations. It has been processed for potato chips and french fries. Observations at processing plants have shown that this selection has considerably less internal discoloration from bruising than Russet Burbank. Six acres of certified seed were grown in 1966. One experienced seed grower remarked, "I have never grown a variety for certification with less effort than 48-1." The specific gravity and yield of 48-1 have been comparable to Kennebec. If planted where verticillium wilt occurs it generally yields more than Kennebec. In a 1966 yield trial at Moses Lake, Washington, total yield of 48-1 was 853 cwt. per acre compared to 671 for Russet Burbank.

Nebraska selection 396.55-3 is a round red that yields a large quantity of No. 1 tubers in the Columbia Basin of Washington. Its total yield was 937 cwt. per acre in the 1966 Moses Lake trial. Certified seed is being increased by 3 Washington seed growers.

WASHINGTON

N. Holstad, R. Kunkel, and R. C. Holland

1966 Potato Variety Trials

Two variety trials were conducted in 1966. One was planted on April 6 and harvested on July 14 (Holstad table 1). The other was planted April 21 and harvested on October 11 (Holstad table 2). The early harvested trial received 150 lb/acre of N, P₂O₅ and K₂O. The late harvested trial received 320 lb/acre of N, P₂O₅ and K₂O. All fertilizer was banded at planting time, 2 inches to each side and 2 inches below the seed piece.

The trials were conducted on land that was first planted to irrigated crops in 1961. Corn was grown in 1961 and 1962, alfalfa in 1963 and 1964, and potatoes in 1965.

Planting was done with the W.S.U. press wheel planter. The rows were 34 inches apart and the seed was spaced 9.3 inches apart in the rows. A randomized complete block design was used. Each plot consisted of a single row 27 feet long. Each variety was replicated 4 times.

The experiment was furrowed for irrigation on May 4. Alternate rows were irrigated on May 4 and May 10. May 12 the plots were cultivated and furrowed. They were irrigated for the second time on May 25. They were placed on a 5-day irrigation rotation on June 8 and shifted to a 7-day rotation on August 4. Irrigation was stopped on July 11 for the July 14 harvest and on September 16 for the October 11 harvest.

Insects were controlled with Thiordan and Aramite. Thiordan dust was applied by airplane on June 14, 30, and July 15 and 29. Thiordan and Aramite were sprayed by airplane on August 15 and September 7.

Diseases were controlled with sulfur and Zineb. The sulfur was dusted on June 14, 30 and July 15 and 29. Zineb was sprayed on August 15 and September 7.

For the July harvest the vines were beaten off on July 13, and the potatoes were dug on July 14. The plots were sorted and weighed on July 15. For the October harvest the vines were beaten off on October 7. The potatoes were dug and placed into storage on October 11, and were washed and graded on October 21.

Holstad table 1. Early harvest yield trial, 1966.

Clone	Yield Per Acre		Specific Gravity ^{1/}	Chip ^{2/} Color	Tuber Color	Tuber Shape
	Total	U.S.No.1				
	Gwt.	Pct.				
48-1	502	83	1.073	21	White	Long oblong
77.57-1	456	83	1.056	18	White	Oblong
16-55-1	435	82	1.067	38	White	Round
B3876-25	432	82	1.075	35	White	Round
93-55-16	421	86	1.076	33	White	Round
302.50-5	420	77	1.069	37	White	Oblong

continued

Holstad table 1, continued.

**Norgold Russet	412	86	1.071	24	Russet	Oblong
A503.42	405	79	1.073	21	White	Round
247.55-2	405	80	1.067	28	White	Oblong
B5023-42	404	63	1.065	22	White	Round
A170-9	399	68	1.072	21	White	Round
**Kennebec	399	77	1.067	28	White	Oblong
16.55-1	389	76	1.076	45	White	Round
4.56-9	388	85	1.059	33	White	Round
396.55-3	379	80	1.065	22	Red	Round
15710-10	378	85	1.067	27	Red	Round
90.56-1	365	76	1.059	24	Red	Oval
396.55-3	358	78	1.069	25	Red	Round
156-51-2	346	69	1.074	28	White	Round
Snowflake	346	86	1.063	30	White	Round
Bounty	345	75	1.065	32	Red	Round
**Russet Burbank	341	63	1.078	31	Russet	Long
**White Rose	331	72	1.063	20	White	Long
A465-11	329	67	1.069	25	White	Oblong
48.57-4	327	75	1.066	24	Red	Oblong
B4023-10	324	79	1.062	23	White	Round
202-57-1	322	75	1.072	17	Red	Round
97.57-2	314	69	1.071	29	Russet	Oblong
B3478-45	311	80	1.072	33	White	Round
Pennchip	307	70	1.062	42	White	Round
Penobscot	307	85	1.072	32	White	Round
99.56-3X	301	80	1.073	31	Red	Oblong
B3726-6	294	67	1.078	34	White	Long
ND5899-1	291	75	1.077	42	White	Round
B5063-3	280	64	1.068	36	Red	Round
**Haig	274	80	1.071	32	Russet	Oblong
Ona	257	67	1.066	27	White	Round
ND6051-2	200	67	1.075	32	White	Round
A576-2	180	54	1.062	20	White	Round
24.58-1	159	63	1.070	28	Red	Long
LSD .05	103	14.8	.0065	2.6		
LSD .01	216	19.5	.0086	314		

1/ Specific gravity reading taken July 19.

2/ The higher the number, the better the potato chip color. Chips fried at 375° F. until bubbling ceased. Fried on July 21, 22.

** Commercial varieties in Washington.

Holstad table 2. Late harvest yield trial, 1966.

Clone	Yield Per Acre		Specific Gravity	Tuber Color	Tuber Shape
	Total	U.S.No.1			
	Cwt.	Pct.			
A503-42	703	82	1.082	White	Round
A170-9	697	70	1.089	Light Russet	Oblong
A576-2	670	55	1.086	White	Round
B5089-17	639	66	1.079	White	Round
White Rose	633	61	1.081	White	Long
Ona	609	87	1.086	White	Round
B5011-7	601	77	1.081	White	Round
B5299-3	575	69	1.077	White	Round
48-1	570	82	1.079	White	Oblong
Russet Burbank	567	72	1.089	Russet	Long
Kennebec (Wash.)	543	80	1.085	White	Oblong
B5036-40	542	83	1.081	White	Round
Kennebec	533	85	1.085	White	Oblong
B5090-11	524	76	1.075	Tan	Oblong
396-55-3	501	82	1.076	Red	Round
B5141-6	501	87	1.101	White	Round
Monona	490	85	1.076	White	Round
77-57-1	487	85	1.065	White	Round
B5132-3	485	71	1.071	Tan	Round
B5088-7	476	80	1.074	White	Round
B5287-16	473	86	1.071	White	Round
B5000-18	472	76	1.076	White	Round
Bounty	463	84	1.082	Red	Round
B3876-25	458	79	1.076	White	Round
Pennchip	452	86	1.074	White	Round
97-57-2	450	84	1.086	Russet	Oblong
Penobscot	449	79	1.087	Tan	Oblong
B4829-7	449	74	1.071	White	Round
16-55-1	444	84	1.076	Tan	Round
B5066-3	441	74	1.067	White	Round
4-56-9	439	90	1.072	White	Oblong
B5052-14	439	73	1.076	White	Round
B5031-18	433	84	1.085	White	Round
B5282-13	432	72	1.082	White	Oblong
W44-3A	424	89	1.086	Tan	Oblong
B5052-7	421	81	1.075	White	Round
ND5899-1	388	78	1.078	White	Round
15710-10	364	88	1.075	Red	Round
90-56-1	344	82	1.082	Red	Oblong
LSD .05	180	11	.0029		
LSD .01	293	15	.0038		

1/ Specific gravity readings taken on December 27, 1967.

WISCONSIN

P. R. Rowe

Genetics and Cytogenetics of the Tuber-Bearing Solanum Species
(Cooperative ARS, USDA, and Wisconsin Station)

Studies of the use of haploids and diploid species in genetics and breeding were continued in 1966. Approximately 450 Gp. Tuberosum haploids and 110 haploid x haploid clones were grown to evaluate fertility and tuber production. Over 200 clones of various combinations of haploids and Gp. Phureja were evaluated at Sturgeon Bay and Hancock, Wisconsin. Doubled haploids are being used to produce second cycle haploids to evaluate further the effect of the female parent on haploid frequency. Detailed studies of pollen germination and pollen treatments are being conducted to investigate the basis for the "pollinator effect."

One of the most important potential uses of haploids is to facilitate the utilization of the diploid species. In 1965, one cultivated and six wild diploid species were used to synthesize four intraspecific bulk populations and eight hybrid populations involving haploid-species hybrids. These populations were grown from true seed in 1966, and Rowe table 1 indicates the tuberization and fertility of some of these species and hybrids. One leaf and one flower from each plant were collected and pressed and are being measured to evaluate the variability within each population. In following generations, bulk sibbing and selection for tuberization will be practiced within each population. This procedure is being followed in an attempt to develop highly variable germ-plasm pools that will be useful to potato breeders.

A study to evaluate the effects of inbreeding in diploids and to develop highly inbred clones has been conducted for the past 2 years. Self-compatible clones from matings between diploid tuber-bearing Solanum species (Phureja, Stenotomum, S. chacoense) and two Tuberosum haploids, (US-W 4 and US-W 1711) are being used as the genetic base. The main effort so far has been directed toward establishing appropriate germ-plasm. Twenty-two parental F_1 clones, 17 S_1 families, and 9 F_1 families, selected from the 1965 seedlings were grown at Sturgeon Bay in 1966. In addition, 13 S_2 and 8 S_3 seedling families were grown. Vigor is severely reduced in the S_2 and S_3 generations making it difficult to produce subsequent generations. Available materials will be evaluated in replicated trials in 1967. Several self-compatible F_1 clones were vegetatively doubled to produce parental stocks for studying inbreeding depression in equivalent diploid and tetraploid families. These clones are being self-pollinated now and the families will be evaluated in 1967.

Investigations of the performance of 15 Phureja-haploid Tuberosum hybrid clones, their vegetatively doubled counterparts, and hybrid families resulting from inter-mating these clones have been conducted for the past 3 years. In each year the diploid clones yielded more than their doubled counterparts, and the tetraploid families yielded as well or slightly better than the diploid families. The morphology and growth rates of these materials were measured in more detail in 1966 to determine factors that may contribute to the observed differences in tuber production. As in previous tests, the diploid clones were taller and had more stems 4 weeks after planting than the tetraploids. Number of stems were positively correlated with yield for the tetraploids but not for the diploid clones. The differences in vegetative vigor probably are due more to

gene balance and level of heterozygosity than to the effects of ploidy level. Crosses were made to develop appropriate materials to evaluate these factors in 1967.

Preliminary crosses made in 1964 between triploid ($2n=36$) and diploid ($2n=24$) *Solanums* produced 9 trisomic plants ($2n=25$). In 1965, over 8000 pollinations of $3x-2x$ matings resulted in 115 seedlings. Thirty-six have been examined cytologically, and 20 aneuploids have been found. Twelve were classified as trisomics. Initial studies of the morphology, fertility, and chromosome behavior of the trisomic plants were started in 1966. It was encouraging to find that 17 of the 24 trisomic plants grown in 1966 produced flowers. Very limited observations indicate that most of the plants will be female fertile and some will be male fertile. It is clear now that trisomics can be produced with reasonable frequency, and that most of them probably will be fertile enough to be used in genetic studies.

Rowe table 1. Tuberization and fertility of 9 bulk populations grown at Sturgeon Bay in 1966.

Population	Total Plants	Percent		Shedding pollen	Seed per fruit ^{1/}
		Tuberized	Flowered		
chc	90	0	90	84	162
sim	90	0	74	74	116
spl	90	0	100	100	104
stn	89	6	68	67	135
H x chc	227	27	81	73	44
H x sim	299	15	74	62	27
H x spl	184	20	100	71	40
H x stn	118	45	42	15	51
stn x H	120	32	72	100	108

^{1/} Following sib matings within each population.

WISCONSIN

W. L. Beale,1/ Darrell Hunter,2/ and F. J. Stevenson3/

Frito-Lay, Incorporated Potato Breeding Program

The 1966 program included observation plots and indexing plots in Alabama, plus the routine program at the Rhinelander Research Farm. Increasing new seedlings, testing of advanced seedlings, and replicated yield and fertilizer tests constituted the bulk of this work. In Madison, seedling production and pollination work, as well as routine processing evaluation of advanced selections was carried out.

Madison Greenhouse

In 1966, parents were selected for their ability to transmit to their progenies, usable chip color under various storage treatments, high specific gravity, high yield, good horticultural type, and a high degree of self fertility. Some parent varieties were selected for their resistance to prevalent diseases, and others for their adaptability to certain geographical areas of the country. A total of 545 crosses were made and an estimated total of 565,840 seeds produced. Approximately 21,698 seedlings were grown in 2½" square pots.

Seedlings, First year in the field: Approximately 36,683 new seedlings were grown. Of these, 21,698 were grown from true seed in the Madison greenhouse, and 12,985 were received from the National Potato Breeding Program at Beltsville, Maryland. At harvest, approximately 5 percent were selected for further testing.

Seedlings, Second year in the field: Approximately 3865 selections were grown for the second year. Of these 397 were saved and samples of each placed in storage at 42° and 38° for processing evaluation.

Seedlings, Third year in the field: 128 selections were planted in blocks of four, 20-hill rows. Thirty-five clones were selected for further testing from the various storage conditions.

Seedlings, Fourth year in the field: 60 selections were planted in blocks of four, 40-hill rows. 56 clones were saved for further testing from 42° and 38° storage and will be indexed in Alabama.

Increase plot: 40 selections were planted in four, 40-hill rows. All were saved for further testing.

Parent plot: Twenty-nine named varieties and 385 numbered varieties were grown in the parent plot in single, 24-hill rows. 345 were selected for future use and will be indexed in Alabama. The 1965 field planting at Rhinelander included a group of 24 chromosome hybrids, obtained from Dr. S. J. Peloquin of the University of Wisconsin.

1/ Manager in Genetics

2/ Assistant Manager in Genetics

3/ Consultant in Genetics for Frito-Lay and Collaborator USDA

These are being given a preliminary evaluation for use in a commercial breeding program. Specific gravity determinations ranged from 1.062 to 1.103 (mean: 1.085). Chip color scores from 42° F. storage and one week reconditioning at 70° F. ranged from 64 to 90 (Mean: 75).

In 1966, a total of 261 24-chromosome hybrids were grown, and 57 were retained for chip color evaluation and breeding studies in 1967.

Chip color and specific gravity tests: The 1965 winter tests on specific gravity for chip color were completed too late to be included in the 1965 report; the data are therefore included here. Four tests were made by maturity groups. Kennebec was used as a check in each case. (Frito-Lay table 1-4).

1966 Fall Harvest Data for Yield Tests

The 1966 yield tests were planted in three groups consisting of new varieties, older varieties, and varieties received from other breeding programs. Each group included Kennebec as a check. The plot design was a randomized block, with 4 replications of 25 hills each. The spacing was on a 12 x 36 inch basis. Fertilizer was banded at planting time. The rate was 750 pounds of 8-32-16, per acre, in addition, 240 pounds per acre of ammonium nitrate was applied as a side dressing, one month after planting. Duplicate plots of 4 replications each were harvested, one in August and the other in September. Yield, specific gravity, and chip color data is shown in Frito-Lay tables 5-7. In August, samples were placed in 50° storage on the day harvested. The samples from the September harvest were placed in 38° and 42° storage on the day harvested and held until mid-January, when processing evaluations were initiated.

Frito-Lay table 1. Summary of the 1965 winter chip color^{1/} and specific gravity data for 20 early maturing varieties. Kennebec added as a check. Yield Test A.

Variety	42°	42° ^{2/}	38°	38°	38°	Specific Gravity	
	Direct	1 Week	1 Week	2 Week	3 Week	38°	3 Week
RD24-2-44	72	71	70	74	76	1.084	
RD30-2-5	72	76	73	78	82	102	
RD42-2-25	76	86	85	88	88	88	
RD49-2-56	71	78	76	76	84	93	
RD49-2-70	72	77	71	81	79	71	
RD102-37	70	86	78	84	86	87	
RD180-12	72	75	69	77	79	89	
RD224-7	72	81	72	84	84	107	
RD258-39	72	80	77	87	88	96	
RD288-11	73	79	74	84	86	96	
RD315-25	73	76	77	82	85	91	
RD333-8	72	79	72	85	85	104	
RD333-21	73	80	77	77	84	93	
RD333-26	74	85	75	85	88	82	
RD333-30	74	84	78	88	87	81	
B5530-8	75	83	79	80	87	88	
B5564-2	72	83	72	85	84	83	

continued

Frito-Lay table 1, continued.

ND4423LB-24	70	80	70	75	80	84
RD46	79	88	83	89	89	102
RD56	73	77	72	78	84	91
Kennebec	72	79	74	82	84	92
Mean	73	81	75	82	84	091
LSD	5	5	7	7	7	006

1/ 90-Lightest colored chips, 80-lowest acceptable chip color on commercial basis. Values are means of 3 replications.

2/ Samples reconditioned at 70° - 75° for the number of weeks stated, following storage for four to six months at temperatures indicated.

Frito-Lay table 2. Summary of the 1965 winter chip color^{1/} and specific gravity data for 25 medium maturing varieties. Kennebec added as a check. Yield Test B.

Variety	42°	42° ^{2/}	38°	38°	38°	Specific Gravity
	Direct	1 Week	1 Week	2 Week	3 Week	
RD13-2-21	75	73	74	82	81	1.084
RD19-2-19	71	72	69	73	80	89
RD22-2-3	68	75	70	77	78	86
RD22-2-14	76	79	77	78	80	87
RD36-2-10	73	77	69	76	80	96
RD42-2-11	79	86	81	83	84	92
RD65-2-12	76	82	76	78	87	106
RD65-2-16	74	79	73	80	86	95
RD65-2-38	71	73	69	75	77	95
RD70-2-1	74	80	75	75	84	90
RD218-10	79	88	81	88	89	94
RD237-6	76	88	77	88	89	85
RD317-4	77	85	79	85	89	88
RD333-31	71	80	71	76	77	90
RD333-54	70	81	75	82	84	99
RD335-15	74	84	72	83	84	97
RD339-21	69	76	74	76	83	92
RD348-20	70	71	71	73	78	89
RD349-28	80	88	78	87	88	91
RD358-20	70	72	70	72	77	82
RD363-22	71	75	71	79	85	88
RD365-7	68	71	69	74	81	96
RD381-20	71	83	73	74	81	90
RD46	80	88	79	84	89	105
RD56	75	85	73	83	89	100
Kennebec	75	82	76	82	85	95
Mean	74	80	74	79	83	092
LSD	5	5	6	6	6	.005

1/ See footnote 1, table 1.

2/ See footnote 2, table 1.

Frito-Lay table 3. Summary of the 1965 winter chip color ^{1/} and specific gravity data for 25 medium late maturing varieties. Yield test C.

Variety	42° Direct	42° ^{2/} 1 Week	38° 1 Week	38° 2 Week	38° 3 Week	Specific Gravity 38° 3 Week
RD13-2-3	69	73	66	74	80	1.081
RD13-2-19	78	87	72	86	87	83
RD13-2-28	72	78	70	84	88	90
RD15-2-25	71	74	70	76	84	108
RD25-2-10	71	77	72	78	87	107
RD35-2-11	75	88	83	89	89	101
RD38-2-1	71	74	71	82	86	93
RD46-2-23	78	85	76	89	88	102
RD66-2-7	75	87	76	84	89	92
RD66-2-8	71	76	72	79	79	78
RD222-14	74	81	75	78	82	94
RD318-12	72	81	83	88	87	89
RD330-3	76	85	81	89	89	92
RD340-15	72	84	76	84	88	80
RD349-17	74	86	86	89	88	90
RD350-22	79	88	85	88	90	89
RD351-20	70	80	71	82	86	98
RD354-14	70	82	74	84	84	92
RD355-21	68	74	72	76	87	89
RD364-24	72	85	75	85	88	87
B5260-6	70	80	75	84	87	81
B5292-3	71	81	72	87	88	87
RD46	83	89	87	89	89	101
RD56	73	87	75	83	89	102
Kennebec	75	84	80	84	88	096
Mean	73	82	76	84	87	092
LSD	5	5	7	7	7	.006

^{1/}See footnote 1, table 1.

^{2/}See footnote 2, table 1.

Frito-Lay table 4. Summary of the 1965 winter chip color ^{1/} and specific gravity data for 29 late maturing varieties. Kennebec included as a check. Yield Test D.

Variety	42° Direct	42° ^{2/} 1 Week	38° 1 Week	38° 2 Week	38° 3 Week	Specific Gravity 38° 3 Week
RD13-2-22	82	84	72	85	84	1.091
RD14-2-3	75	78	70	77	85	90
RD14-2-9	73	81	73	86	88	80
RD17-2-22	69	73	72	78	84	103
RD24-2-51	74	83	74	85	82	93
RD30-2-14	73	79	72	75	78	91
RD49-2-15	70	74	71	81	78	99
RD65-2-34	75	79	71	76	77	104
RD85-20	71	79	71	83	87	98
RD103-21	75	80	74	79	84	88
RD222-15	75	80	74	81	83	96

continued

Frito-Lay table 4, continued.

RD301-1	77	87	78	89	90	95
RD311-7	75	83	73	84	89	91
RD312-17	68	75	69	76	82	98
RD325-11	78	88	77	87	87	89
RD329-8	79	85	82	88	89	92
RD330-4	74	86	74	86	89	95
RD333-12	72	84	74	85	86	91
RD337-21	73	79	74	82	85	90
RD349-15	78	88	78	87	89	83
RD351-30	75	88	77	89	88	95
RD352-9	75	83	82	89	89	91
RD362-5	78	88	72	85	90	99
RD382-24	74	86	78	89	90	99
RD387-17	71	75	69	77	83	76
B5258-11	84	84	80	88	89	106
RD46	86	88	82	85	90	104
RD56	81	87	76	84	88	98
Kennebec	76	84	76	86	89	91
Mean	75	82	75	84	86	1.094
LSD 5%	5	5	5	5	5	.007

1/ See footnote 1, table 1.

2/ See footnote 2, table 1.

Frito-Lay table 5. Yield Test A. Summary of Data covering 23 recently selected clones. RD46 and Kennebec included as checks. Data shows comparative yields in August and September, also specific gravity and chip color^{1/} performance in August, 1966.

Variety	Yield Per Acre		Specific Gravity	Early Harvest Chip Color ^{2/} Post-Harvest Storage at 50° F. as indicated		
	August	September				
	No.1 Cwt.	No.1 Cwt.		1 Week	2 Weeks	3 Weeks
RD19-3-30	125	197	1.069	79	73	69
RD20-3-3	122	246	64	77	69	66
RD21-3-12	113	189	70	85	87	84
RD21-3-25	106	231	58	79	74	73
RD21-3-32	120	141	65	89	88	78
RD21-3-34	102	199	66	80	82	74
RD21-3-42	122	234	66	84	77	71
RD21-3-45	167	280	66	79	73	67
RD21-3-51	124	263	63	77	70	67
RD22-3-3	107	232	59	81	73	69
RD22-3-10	130	250	60	81	72	68
RD36-3-1	48	152	59	83	83	74
RD36-3-5	149	248	55	87	84	71
RD39-3-1	58	153	60	75	77	73
RD42-3-4	86	184	81	87	82	83
RD47-3-17	98	242	57	79	81	78
RD47-3-23	113	229	59	81	78	72
RD53-3-32	115	236	66	78	74	70
RD59-3-11	108	199	63	77	69	66

continued

Frito-Lay table 5, continued.

RD63-3-2	149	170	72	72	71	69
RD289-18	88	177	59	80	81	73
RD15-2-2	132	256	57	73	69	65
RD350-22	109	171	66	88	82	76
RD46	120	215	64	71	67	68
Kennebec	125	255	68	82	79	74
Mean	113	214	1.064	80	77	72
LSD 5%	15	19	.006	8	8	8

1/90 lightest colored chips, 80 lowest acceptable chip color on commercial basis.

Values are means of 3 replications.

2/August harvest samples were stored at 50° F. for 1 week, 2 weeks and 3 weeks, and then were fried direct from storage.

Frito-Lay table 6. Yield Test B. Summary of Data covering 23 advanced selections.

RD46, and Kennebec, included as checks. Data shows comparative yields in August and September: Also, specific gravity and chip color¹/performance in August 1966.

Variety	Yield Per Acre		Specific Gravity	Early Harvest Chip Color ² / Post-Harvest Storage at 50° F. as indicated		
	August	September				
	No.1 Cwt.	No.1 Cwt.		1 Week	2 Weeks	3 Weeks
RD13-2-19	181	287	1.062	89	86	83
RD13-2-28	147	244	62	87	85	79
RD19-2-19	114	227	62	78	75	72
RD24-2-51	122	266	68	75	74	70
RD30-2-5	150	212	73	87	82	76
RD35-2-11	106	216	65	86	86	74
RD42-2-11	151	249	65	74	73	69
RD42-2-25	171	234	74	82	74	72
RD46-2-23	102	211	75	88	86	84
RD66-2-7	143	239	63	77	75	71
RD70-2-1	127	182	62	87	88	83
RD317-4	95	172	63	70	72	74
RD17-2-22	93	239	68	81	75	73
RD32-5-11	93	202	67	74	73	66
RD330-4	96	233	66	75	75	70
RD333-54	129	188	75	87	78	77
RD340-15	201	278	63	72	70	70
RD349-17	108	236	68	78	78	74
RD47-2-21	80	190	66	84	82	73
RD351-30	72	204	64	79	81	73
RD362-5	23	150	60	70	70	69
B5539-8	142	203	68	85	85	75
B5564-2	139	211	67	84	79	75
RD46	136	239	70	80	79	76
Kennebec	120	279	57	68	70	67
Mean	122	226	1.066	80	78	74
LSD 5% level	19	34	.006	6	6	6

¹/See footnote 1, table 5.

²/See footnote 2, table 5.

Frito-Lay table 7. Yield test C. Summary of data covering 23 accession varieties. RD46 and Kennebec included as checks. Data shows comparative yield in August and September, also specific gravity and chip color¹/performance in August 1966.

Variety	Yield Per Acre		August Specific Gravity	August 50° 1 Wk.	August 50° 2 Wk.	August 50° 3 Wk.
	August No.1	September No.1				
5765-1	157	244	1.059	69	67	66
56.2	107	128	70	71	67	67
56.28-1	154	188	63	72	70	68
ND5488-11	111	125	75	80	73	70
ND5768-10	151	146	71	84	82	74
ND5886-2	190	227	65	82	72	72
ND5899-1	172	236	74	82	81	76
ND5903-12	120	167	72	84	76	71
ND6017-5	142	183	65	79	74	72
ND6051-2	109	185	81	80	74	72
ND6286-1	155	143	67	75	70	69
ND6428-1	162	177	71	72	67	66
Alaska Rus.	140	228	69	73	70	67
Haig	163	247	66	79	76	74
302-50-5	208	260	67	76	75	71
4.56-9	105	260	53	67	66	65
Nebr.156-51-2	94	195	82	80	80	76
F4724	155	233	68	74	72	66
F5247	143	253	70	73	69	65
F5609	176	325	70	75	74	69
F5850	127	191	66	89	84	79
Reliance	201	243	62	72	69	69
Ona	48	161	54	66	61	65
RD46	143	237	59	76	76	70
Kennebec	130	184	60	70	69	66
Mean	143	215	1.067	76	73	70
LSD 5%	22	26	.007	5	5	5

¹/ See footnote 1, table 5.

²/ See footnote 2, table 5.

WYOMING

W. A. Riedl, G. S. Howard and K. P. Rao

Variety and seedling performance trials were conducted at Laramie and Torrington in 1966. The results of these trials are shown in Wyoming tables 1 and 2.

The tables show total yield, yield of US No. 1's, percent of US No. 1's, percent stand, and specific gravity. Additional information such as previous crop, date of planting, plot size, experimental design, number of irrigations, dates of roguing, frosts, harvest and grading is shown below each table.

The lack of sufficient irrigation water and herbicide damage resulted in low yields at Laramie. The lack of timely irrigations at Torrington resulted in a high percentage of poor type tubers that lowered the yield of US No. 1's.

Seedling W-2850, Red LaSoda, Viking, and Norland produced the highest total yield and US No. 1 yield in the Laramie trial. Seedling W-2850, Platte, seedling W-3050, and Norland ranked highest in percent of US No. 1's, while Hi-Plains, and Platte had the highest specific gravity.

Red Pontiac, seedling W-2850, Hi-Plains, Platte, Red LaSoda and Teton produced the highest total yield at Torrington. While seedling W-2850, Red Pontiac, Platte, Teton and Norland produced the highest yield of US No. 1's. Seedling W-2753, Hi-Plains and Blanca had the highest specific gravity.

Seedling W-2850 has ranked high in total yield and in yield of US No. 1's among the varieties tested in these trials for the past 4 years. Tuber indexed seed of this seedling was increased at the Cheyenne Horticultural Field Station in an isolated plot and approximately 100 cwt. of seed was produced. It is planned to name and release it as a new variety. It is a high yielding variety on both dryland and irrigated conditions in Wyoming. It is medium-late in maturity with erect vines and has round, red tubers. It harvests well with a combine harvester. The specific gravity is about average among the principal varieties grown in Wyoming.

In addition to these performance trials 30 seedlings were tested at Laramie in a preliminary performance trial in one-row plots 40 ft. long without replication. Seventeen seedling families were grown and selections were made.

Wyoming table 1. Potato variety and seedling performance trial, Laramie, 1966.

Variety or Seedling	Yield Per Acre		Stand		Specific Gravity
	Total	U.S. No. 1			
	Cwt.	Cwt.	Pct.	Pct.	
W-2850	197	188	95	86	1.080
Red LaSoda	196	175	89	84	1.085
Viking	194	169	87	89	1.083
Norland	187	171	91	99	1.077
Haig	186	166	89	92	1.084
Hi-Plains	176	135	77	98	1.089
Platte	170	161	95	98	1.087
W-3050	159	146	92	93	1.081
Kennebec	155	128	83	90	1.081

continued

Wyoming table 1, continued

Norgold	136	112	82	78	1.081
W-2650	134	117	87	58	1.075
Katahdin	123	108	88	82	1.085
Catoosa	119	102	86	89	1.069
Teton	119	90	76	89	1.077
Blanca	109	91	83	63	1.079
W-1122	102	84	82	76	1.075
Russet Burbank	83	40	48	49	1.081
General Average	150	127	84	83	1.081
LSD at 5% level	27	26			

Previous crop--Alfalfa Planted in 1-row plots, 40 ft. long, in 4 randomized blocks. Rows spaced 38 inches apart with hills spaced 12 inches apart.

Sprinkle irrigated May 31, surface irrigated July 11, and August 5. Dusted with sulphur and 5% DDT July 6, and 29. Rogued July 7, 29 and August. Date of frost August 26 (10% leaf damage), September 1 (light), October 2 (killing).

Date of harvest--October 5. Date tubers were graded--November 19.

Date specific gravity was obtained--December 14.

Wyoming table 2. Potato variety and seedling performance trial, Torrington, 1966.

Variety or Seedling	Yield Per Acre		Stand		Specific Gravity
	Total	U.S. No. 1			
	Cwt.	Cwt.	Pct.	Pct.	
Red Pontiac	417	250	60	90	1.065
W-2850	375	303	81	78	1.076
Hi-Plains	370	157	42	93	1.084
Platte	342	239	70	95	1.077
Red LaSoda	327	184	56	86	1.065
Teton	292	207	71	93	1.069
W-2753	282	147	52	76	1.085
Catoosa	269	165	61	89	1.067
Norland	269	202	75	84	1.065
Katahdin	263	160	61	89	1.074
Blanca	253	191	75	86	1.081
Viking	252	156	62	74	1.066
W-3174	244	151	62	88	1.077
Kennebec	199	93	47	68	1.074
W-1122	187	60	32	75	1.065
W-3050	178	101	57	83	1.056
Norgold	170	99	58	74	1.070
Haig	152	98	64	67	1.077
General Average	268	165	60	83	1.076
LSD at 5% level	58	48			

Previous crop--Alfalfa; Date planted--May 18; Planted in 1-row plots, 35 ft. long in 4 randomized blocks. Rows spaced 38 in. apart with hills spaced 12 in. apart. Irrigated June 28, July 11 and August 3. Sprayed twice during growing season. Rogued July 11 and August 29. Date harvested--Sept. 29; Date tubers were graded--Nov. 17; Date specific gravity was obtained--Dec. 14.

WEST VIRGINIA
M. E. Gallegly

The work in West Virginia in 1966 continued to emphasize resistance to late blight. In the Canaan Valley near Davis, West Virginia, (elevation 3200 ft.) all clones were increased and rogued; early harvesting was carried out, and selections were made from family lines. Yield trials were located in the Tygart Valley near Huttonsville. In addition, clones selected for multigenic resistance in the greenhouse, were screened again in a field test in the Tygart Valley. Greenhouse work included screening seedlings from true seed for multigenic resistance to late blight, and routine checks of clones for the presence of virus diseases.

Screening Seedlings for resistance to late blight.--Seed of 40 family lines, supplied by R. V. Akeley, were planted in vermiculite in 4" clay pots (approx. 100 plants/pot, total approx. 15,000 plants). The pots were placed in galvanized metal trays and watered once with Hoagland's nutrient solution (see 1965 report for detail). One month after planting the seedlings were inoculated with race 1,2,3,4 of P. infestans. Percentage survival varied from 0 to approx. 34% (West Virginia table 1). First-year tubers from the surviving seedlings will be planted in the field in the summer of 1967 and selections made for commercial characters. The selections will be evaluated for multigenic resistance in the field test in 1968.

Field test for multigenic resistance to late blight.--Because of the drought conditions of the previous few years, and the resultant uncertainty of blight development, an overhead irrigation system was installed in the blight plot in 1966. The plot was located along the Tygart River and isolated from commercial fields. Two-hill units of each selection was bordered on one side by a row of the susceptible Russet Rural variety (every 3rd row). Every fifth plant of Russet Rural was inoculated with race 1,2,3,4. The irrigation system was not installed in time to accurately evaluate early varieties which were approaching natural maturity. Within two weeks after the system was in operation, the Russet Rural plants were dead and marked differences in resistance between selections were apparent. Using a disease index of 0 = no blight to 5 = plants dead, the number of medium to late maturing clones in the disease index classes were as follows: class 0, 32 clones; class 1, 28; class 2, 35; class 3, 24; class 4, 68; and class 5, 20 clones. Plants in the 0 class probably carried a new R-gene other than the first 4. Among 57 clones in the medium-late maturity class which had survived the above seedling test, only one was rated with a disease index of 5.

During 1967 plans are to enlarge the irrigation system and introduce blight while the plants are still small. Clones with disease index ratings of 1 and 2, which also appear to have desirable commercial qualities, will be placed in maximum increase plots to produce seed for further quality evaluation.

Yield trials.--Replicated field plots were located at Huttonsville and Point Pleasant, West Virginia. The latter location in the Ohio River Valley was for evaluation of selections for early market potential, but the plants were killed by frost May 12. The results from the trials at Huttonsville are shown in West Virginia table 2. Two selections, B5089-WV6 and B5264-WV4, yielded well in spite

of the dry season. However, the multigenic blight resistance of these clones (4 and 4+) is lower than desired. B5089-WV6 also produced the top yield in the 1966 trial, and B5264-WV4 was third, with no significant difference between them.

West Virginia table 1. Percentage survival per family of seedlings segregating for resistance to race 1,2,3,4 of *P. infestans*.

Family	Approx. No. plants	Approx. Survival Pct.	Family	Approx. No. plants	Approx. Survival Pct.
B1719	900	8	B6651	200	15
B1720	600	11	B6652	30	8
B1721	100	6	B6653	600	24
B1722	300	6	B6654	200	22
B1723	170	0	B6655	900	7
B1724	900	5	B6656	60	6
B6634	70	16	B6657	200	22
B6635	20	1	B6658	600	22
B6636	600	13	B6659	100	34
B6637	300	15	B6660	100	16
B6638	25	15	B6661	100	20
B6639	230	16	B6662	70	23
B6640	700	3	B6663	600	17
B6641	600	7	B6664	500	7
B6642	600	4	B6665	150	14
B6643	400	5	B6666	200	19
B6644	900	11	B6667	500	16
B6645	600	6	WV14-17 (self)	300	11
B6646	140	10	WV69-2 (self)	100	16
B6647	400	6	WV93-4 (self)	300	30
B6648	300	4	Navajo (self)	300	8
B6649	200	9	Katahdin (self)	300	12
B6650	70	19			

West Virginia table 2. Field performance of certain West Virginia selections in 1966.

Variety	Maturity	Tuber Appearance	W. Va. Late Blight Index Field-1966	Specific gravity 1965 ^{1/}	Yield No. 1 Per Acre	Pct.	Cwt.
Irish Cobbler	1	2+	5	1.085	75		154
Katahdin	3	2	5	1.081	72		358
Kennebec	4	3	4+	1.086	45		236
Ona	4	2	-	1.085	76		361
Sebago	3+	2	4+	1.080	76		315
I 1333-WV2	2	2	-	1.079	78		262
B4518-WV11	5	3	1+	1.100	69		350
B5089-WV6	3	2+	4	1.074	70		439
B5264-WV4	4	1+	4+	1.085	79		548
B5264-WV6	3	3	2+	1.076	62		235
B5525-WV3	5	3	2+	1.082	68		324
B5671-WV3	4	4	1+	1.076	47		245
B5716-WV2	4	2+	1+	1.086	52		298
B5718-WV10	3	2	4	-	78		360

^{1/} Data from tubers grown in the Canaan Valley. LSD 19:1 - 91.6
99:1 - 121.2